

ENCYCLOPÆDIA BRITANNICA



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**"LET KNOWLEDGE GROW FROM MORE TO MORE
AND THUS BE HUMAN LIFE ENRICHED."**

संदर्भ प्रस्ताव
चैक्स इव ये ही उपयोग करते हैं

ENCYCLOPÆDIA BRITANNICA

A New Survey of Universal Knowledge

Volume 20

SARSAPARILLA to SORCERY

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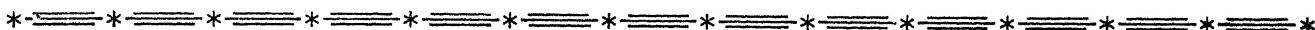
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Volume 20

SARSAPARILLA to SORCERY

SARSAPARILLA, a popular drug, prepared from the fibrous roots of several species of the genus *Smilax*, indigenous to Central America from the southern and western coasts of Mexico to Peru. Only two species have been identified with certainty. These are *Smilax officinalis* and *S. medica*, which yield respectively the so-called "Jamaica" and the Mexican varieties. They are large perennial dioecious climbers growing from short thick underground stems, from which rise numerous semiwoody flexuous angular stems bearing large alternate stalked long-persistent and prominently net-veined leaves, from the base of which spring the tendrils which support the plant. When boiled in water the root affords a dark extractive matter; boiling alcohol extracts a neutral substance in the form of crystalline prisms, which crystallize in scales from boiling water. This body, which is named parillin, is allied to the saponin of quillaia bark, from which it differs in not exciting sneezing. Sarsaparilla has a popular reputation as an alterative, but is professionally regarded as inert and useless.

The varieties of sarsaparilla met with in commerce are the following: Jamaica, Lima, Honduras, Guatemala, Guayaquil and Mexican. Of these, differing in their character, the first-named yields the largest amount of extract, viz., from 33% to 44%; it is the only kind admitted into the British pharmacopoeia. On the continent, especially in Italy, the varieties having a white starchy bark, like those of Honduras and Guatemala, are preferred.

• **SARSFIELD, PATRICK** (?–1693), titular earl of Lucan, Irish Jacobite and soldier, belonged to an Anglo-Norman family long settled in Ireland. He was born at Lucan, but the date is unknown. Patrick, who was a younger son, entered Donegan's regiment of foot on Feb. 9, 1678. During the last years of Charles II he served in the English regiments which were attached to the army of Louis XIV of France. The accession of King James II led to his return home.

He took part in the suppression of the Western rebellion at the battle of Sedgemoor on July 6, 1685. In the following year he was promoted to a colonelcy. King James had adopted the dangerous policy of remodelling the Irish army so as to turn it from a Protestant to a Roman Catholic force, and Sarsfield, whose family adhered to the church of Rome, was selected to assist in this reorganization. When the king brought over a few Irish

soldiers to coerce the English, Sarsfield went in command of them. Sarsfield had a brush with some of the Scottish soldiers in the service of the prince of Orange at Wincanton. When King James fled to France, Sarsfield accompanied him.

In 1689 he returned to Ireland with the king. During the earlier part of the war he did good service by securing Connaught, and was promoted to brigadier, and then major general. After the battle of the Boyne (July 1, 1690), and during the siege of Limerick, Sarsfield came prominently forward. His capture of a convoy of military stores at one of the two places called Ballyneety, between Limerick and Tipperary, delayed the siege of the town till the winter rains forced the English to retire. This achievement made him the popular hero of the war with the Irish. When the cause of King James was ruined in Ireland, Sarsfield arranged the capitulation of Limerick and sailed to France on Dec. 22, 1691. He received a commission as lieutenant general (maréchal de camp) from King Louis XIV and fought with distinction in Flanders till he was mortally wounded at the battle of Landen (Aug. 19, 1693). He died at Huy two or three days after the battle. In 1691 he had been created earl of Lucan by King James. He married Lady Honora de Burgh, by whom he had one son, James, who died childless in 1718.

See J. Todhunter, *Life of Patrick Sarsfield* (1895).

SARTHE, a department of France, formed in 1790 out of the eastern part of Maine, and portions of Anjou and of Perche. Pop. (1936) 388,519. Area 2,410 sq.mi. It is bounded north by the department of Orne, northeast by Eure-et-Loir, east by Loir-et-Cher, south by Indre-et-Loire and Maine-et-Loire and west by Mayenne. The department includes the greater part of the basin of the Sarthe, which drains the large bay in the southern flank of the hills of Normandy, and the city of Le Mans is at the focus of this bay, where the Sarthe from the northwest joins the Huisne from the northeast. It is floored largely by Jurassic and Cretaceous rocks succeeding one another eastward, with the Armorican Palaeozoics on its western border. Southeast of the Huisne the Eocene deposits stand out, forming a relatively poor territory. The Loir flows through the southern edge of the department to join the Sarthe in Maine-et-Loire; along its chalky banks caves have been hollowed out which, like those along the Cher and the Loire, serve as dwelling houses and stores. The

mean annual temperature is 51° to 52° F. The rainfall is between 25 and 26 in.

The department is mainly agricultural. There are three distinct districts:—the corn lands to the north of the Sarthe and the *Huisne*; the region of barren land and moor, partly planted with pine, between those two streams and the *Loir*; and the wine-growing country to the south of the *Loir*. Sarthe produces much barley and hemp. The raising of cattle and of horses, notably those of the *Perche* breed, prospers, and fowls and geese are fattened in large numbers for the Paris market. Apples are largely grown for cider. The chief forests are those of *Bercé* in the south and *Perseigne* in the north; the fields in the department are divided by hedges planted with trees. Coal, marble and freestone are among the mineral products. The staple industry is the weaving of hemp and flax, and cotton and wool-weaving are also carried on. Paper is made in several localities. Iron-foundries, copper and bell foundries, factories for provision-preserving, marbleworks at *Sablé*, potteries, tileworks, glass-works and stained-glass manufactories, curries, machine factories, wire-gauze factories, flourmills are also important. The department is served by the *Ouest-État*, the *Orléans* and the State railways, and the *Sarthe* and *Loir* provide about 100 mi. of waterway, though the latter river carries little traffic.

The department forms the diocese of Le Mans and part of the ecclesiastical province of Tours, has its court of appeal at Angers, and its académie (educational division) at Caen, and forms part of the territory of the IV army corps, with its headquarters at Le Mans. The arrondissements are named from Le Mans, the chief town, La Flèche and Mamers. There are 33 cantons and 386 communes. The chief towns are Le Mans, La Flèche, La Ferté-Bernard, Solesmes (*qq.v.*) and *Sablé*.

SARTI, GIUSEPPE (1729–1802), Italian composer, was born in Faenza, Dec. 1, 1729. He studied under the direction of Padre Martini at Bologna, and was organist at the cathedral in Faenza 1748–50. At the age of 22 he completed his first opera, *Pompeo in Armenia*, successfully produced in Faenza (1752). This success was followed by *Il Rè pastore*, in Venice (1753), which with others established his fame abroad.

He was called by Frederick V of Denmark to Copenhagen, where for several years he directed Italian opera and was made court conductor. He was then commissioned by the Danish king to engage singers in Italy for a new company. During his absence in Italy King Frederick died, and Sarti remained in Italy for three years. On his return to Copenhagen in 1768, he conducted the court opera until 1775, when he was dismissed for political reasons. During his stay in Denmark, he composed 20 Italian operas and many Danish Singspiele.

From Copenhagen he went directly to Venice, where he was made director of the Ospedaletto conservatory. In 1779 he won the directorship of the cathedral in Milan, in competition with the leading musicians in Naples. This gave him the opportunity to write several masses, a Miserere a 4, and motets. It was during this period that he achieved his greatest dramatic success by writing some 15 operas, among them *Giulio Sabino* (Venice, 1781) and *Fra i due litiganti il terzo gode* (*Le Nozze di Dorina*) (Milan, 1782). This great success established his reputation and brought him many students of note, among them Cherubini, who became his assistant.

Sarti left Italy again upon invitation from Catherine II of Russia (1784) to go to St. Petersburg. On his way he stopped in Vienna, where he was received in court by the emperor, and met Mozart, who was then in his prime. In St. Petersburg, Sarti was welcomed with even greater favour in the court of Catherine II. Under his directorship, the Italian opera attained unparalleled success and perfection. The empress, who showed great interest in his achievements, wrote the libretto for his opera *Olega*. Beside being a composer, Sarti was a skilled mathematician and physicist. He invented a device for counting tone vibrations for which he was made honorary member of the St. Petersburg Academy of Science. Among the works he composed for the Russian court is a Te Deum composed on the taking of Ochakov by Potemkin. In this composition Sarti used fireworks and

cannon for accent and martial effect. He lost favour with the empress for a short time, and Prince Potemkin came to his aid by establishing a school in a village in Ukraine, and making Sarti director. The empress restored him to favour again, however, and made him head of a new conservatory planned after those of Italy.

Sarti was a prolific composer, and wrote 54 operas. They possess great character and charm, and Mozart wrote variations on an air from one of them. Among other compositions are a requiem, two Te Deums, two concertos, six sonatas for the harpsichord and many masses. Several of the masses are frequently performed. Very few of his compositions have been engraved. Most of his works were placed in the library of the conservatory in Paris, and that of Naples.

After the death of the empress of Russia, Sarti made plans to revisit Italy, and stopped on his way in Berlin, where he fell seriously ill and died July 28, 1802.

SARTS. The Sarts are an Iranian Turkish tribe, numbering about 2,000,000, who live in Ferghana and Syr Daria territories. They are highly organized, living in permanent villages, with a developed Sufi system of education. They practise a system of agriculture, using irrigation canals, and growing fruit and cotton. They are also accomplished traders. In religion they are Sunnites, many of them belonging to the Sufi order. They have mixed considerably with the Tadzhiks, the remnant of the old non-Turkic population, and physically are largely of the Alpine type. In culture they differ widely from most of the tribes speaking cognate languages.

(L. H. D. B.)

SARWAT PASHA, ABDEL KHALEK (1873–1928). Egyptian statesman, was educated in Cairo, and became secretary to the Legal Control commission. In 1905 he became vice-president of the native courts of Kena province, and judge in the Cairo children's correctional court. In 1907 he was appointed governor of Asyut province and in 1908 *procureur-général* of the native courts. In 1914 he was appointed minister of justice in Rushdi Pasha's cabinet, resigning with Rushdi in 1919. In 1921 he joined Adly Pasha's cabinet as minister of the interior, and on March 21, 1922, he became prime minister. He resigned in Nov. 1922. In June 1926, he became minister for foreign affairs in Adly Pasha's cabinet, and on the fall of Adly Pasha in April 1927, Sarwat Pasha formed a new ministry. After a proposed Anglo-Egyptian treaty of alliance was rejected by Wafd leaders, Sarwat resigned (March 1928).

Sarwat Pasha died in Paris on Sept. 22, 1928.

SARZANA, a town and episcopal see of Liguria, It., in the province of La Spezia, 9 mi. E. of Spezia, on the railway to Pisa, at the point where the railway to Parma diverges to the north, 59 ft. above sea level. Pop. (1936) 4,645 (town); 13,492 (commune). The handsome cathedral of white marble in the Gothic style, dating from 1204, was completed in 1471. It has a fine 12th-century crucifix and other works of art. The old citadel, built by the Pisans in 1263 was re-erected by Lorenzo de' Medici in 1488. The castle of Sarzanello was built by Castruccio Castracani (1281–1328), whose tomb by the Pisan Giovanni di Balduccio is in S. Francesco. Glass bottles and bricks are made there.

Sarzana was the birthplace of Pope Nicholas V. Its position at the entrance to the valley of the Magra (anc. *Magra*), the boundary between Etruria and Liguria in Roman times, gave it military importance in the middle ages. It arose as the successor of the ancient Luna, 3 mi. S.E.; the first mention of it is found in 983, and in 1202 the episcopal see was transferred there.

SASARAM, a town of India, in the Shahabad district of Bihar, with a station on the East Indian railway. Pop. (1941) 27,201. It is famous as containing the tomb of the emperor Sher Shah (1540–45). The tomb, which is the finest example of Pathan architecture in India, with a dome 101 ft. high, stands on an island in the middle of an artificial lake. The town also contains the tomb of Sher Shah's father, another fine specimen of Pathan art; a building called the Kila, or fort, said to have been his palace; and the grave and unfinished tomb of Sher Shah's son, the emperor Salim Shah. Outside is the ruined tomb of Alawal Khan, the reputed architect of Sher Shah's and his father's tomb. A

rock edict of Asoka is inscribed on the Chardan Pir Shahid hill, close to the town.

SASKATCHEWAN. A province of Canada, in the centre of the northwest, Saskatchewan lies between 49° and 60° N. lat. and approximating 101° 20' and 110° W. long.

History.—The area now called Saskatchewan takes its name from the great river of the plains, which is in full Sis-Sis-Katchew-Wan-Sepie—the Big Angry Water—happily abbreviated in the town name Swift Current. Both river and territory, as yet unexplored and unknown, were granted by Charles II in 1670 to the Hudson's Bay company. The first knowledge of this part of the territory came from the inland journey of Henry Kelsey, a servant apprentice of the company who ran away to the Assiniboin Indians and on his return made a journey of exploration for the company (1691–92), as set down in their records, far inland but of unknown route and not on the great rivers. The French explorer of the west, Pierre de Varennes, sieur de la Vérendrye (1731–44), discovered the Red river, and his sons penetrated the territory farther west and set up temporary posts (Pas-koyac, etc.) on the Saskatchewan (c. 1750). Anthony Hendry, a boy outlaw smuggler, also in the service of the company, made a voyage with Indians from Fort Nelson to the Saskatchewan, which he ascended to the site of the present Edmonton. Samuel Hearne set up a company trading post beside the North Saskatchewan, Fort Cumberland, 1774. The cession of French Canada opened the way for the North West company to enter the west, and until their union in 1821 both companies—and after that the thus consolidated Hudson's Bay company—set up posts and traded on the plains. By the middle 1840s trade was in operation at Cumberland House, Carlton House and Fort Pitt, just at the present boundary with Alberta, but forts were established and abandoned according to the state of trade. There was no other settlement except the population around the posts, the company's immediate servants, mostly from Scotland, the boatmen and bushmen French-Canadian *voyageurs* (some of them métis). Occasional explorers passed through: Sir George Simpson, bound round the world, 1841; Capt. John Palliser, surveying for the British government a western passage across North America, 1847–51; and Lord Milton and Cheadle, heading for the Rockies, 1862. Apart from that and the seasonal hunt of the herds of buffalo by the Indians from elsewhere, the open plains were empty. Capt. (later Gen. Sir) William Butler wrote in 1870, "one may wander 500 miles in a direct line without seeing a human being."

The transfer to Canada (1869), railway connection from St. Paul, Minn., to Winnipeg (1878) and the era of immigration and homestead settlement (U.S. 1862; Canada 1875) rapidly opened the northwest. The dispossession of the half-breed population, without proper assurance of their rights, led to two rebellions—on the Red river in 1869–70, on the Saskatchewan in 1885. The completion of the Canadian Pacific railway (1885) aided farm settlement. The Northwest Territories south of the 60th parallel were organized for government in 1875 (see NORTHWEST TERRITORIES); the North West Mounted Police was established in 1873. In 1882 the four provincial territories Assiniboia, Saskatchewan, Alberta and Athabasca were organized with Regina as the seat of government and given representative government in a territorial legislature at Regina in 1888. The rapid development of the northwest after 1901 led to the creation of the province of Saskatchewan in 1905, with its sister province Alberta. Its history till World War I was of unparalleled rapid growth (pop., 1901, 91,279; 1911, 492,432) which brought with it the creation of municipalities, the organization of education (University of Saskatchewan at Saskatoon, 1907) and the organization of the professions and of social life. The influx of population created the diversity of national and cultural origin described below. The part played by the province in World War I is described elsewhere. In the period between World Wars I and II immigration slackened and stopped. The agrarian interest of the prairie provinces clashed with the vested interests of manufacture and capital in the east. This led to the creation of radical and farmer parties. The government alternated between the control of liberal and conservative parties, both, however, largely agrarian and progres-

sive in policy. The farmers' interests led to the formation of co-operative pools for controlling wheat sales. Their first success in holding local prices broke under the weight of world conditions. The heavy years of depression were accentuated by drought, poor crops and the dust storms which seemed ominous for the future of agriculture. Before World War II, Saskatchewan was struggling with farm debts, provincial deficits and the question of moving part of the population north and modifying machine farming. The return of seasons of rain and the huge crop of 1942 (the prairie provinces produced 587,000,000 bu.) showed that the agricultural depression was only a cyclical, not a final, disaster.

Area and Population.—Saskatchewan has a total area of 251,700 sq.mi., of which 237,975 sq.mi. is land. The water area, almost entirely in the north, includes the large lakes Athabaska (3,058 sq.mi., of which 2,165 are in Saskatchewan), Reindeer (2,058 sq.mi. out of 2,444 sq.mi.) and Wollaston (768 sq.mi.), a lake completely in the province. Saskatchewan, with a population in 1951 of 831,728, ranks fifth among the provinces of Canada; pop. (1911) 492,432, (1931) 921,785, (1941) 895,992. Almost the entire population lives in the southern part of the province, between the North Saskatchewan river and the southern boundary. Saskatchewan, like its sister prairie provinces, has a greater mixture of national and cultural groups than the rest of Canada; 1941 classifications showed 44% of British origin, either directly or via the United States, 5% French and 47% of European origin other than French. Among these latter Germans equalled 17% of the whole population, Scandinavians 7%, Ukrainians 8%, Poles more than 3%, Russians 3%, with a scattering of 12 other European national groups. There are about 15,000 Indians living under the care of the federal government in reservations covering more than 1,000,000 ac. At the beginning of the 20th century, the population of the province was 85% rural, 15% urban; 41 years later the percentages were 67.1% and 32.9%, respectively. At the same time, classified returns showed 27% of the people in the Roman Catholic church, 25.7% in the United Church of Canada, 13% Anglican, 11.7% Lutheran, 6% Presbyterian, 4% Orthodox Greek, 3.7% Mennonite and the balance scattered through 22 other creeds.

Geography and Geology.—Saskatchewan, having purely artificial boundaries, is in no sense a geological or geographical unit. It belongs geologically in part to the great Pre-Cambrian shield which encircles Hudson bay, in part to the wide belt of the interior plains which unites Saskatchewan with North Dakota and Montana and extends from the Manitoban lakes to the foot of the Rockies where the cordilleran mountain system begins. The geology of the province can therefore best be studied in its continental relation (see CANADA: Geology). Geographically the province consists of a northern half, an area built up of Pre-Cambrian rock, a hummocky wilderness of forest, lake and swamp, mainly drained by the Churchill river to Hudson bay, but on the northwest to Lake Athabaska and the Mackenzie river. This area is as yet not fully explored; the development of its potential assets—minerals, pulpwood, power—had by the mid-1940s only just begun. Below this area is the basin of the North and South Saskatchewan rivers, which join in the centre of the province. The elevation at this point is 1,244 ft. above sea level. The wooded and varied contour of the North Saskatchewan river area gives way to open country, the prairie region to the south, flat or rolling and at times rising to such elevations as the Cypress hills. The altitude on the river level at Saskatoon is about 1,500 ft. The altitude of Regina (station) is 1,896 ft., of Swift Current 2,432 ft. A small area in the southeast of the province is drained by the Souris river (on which is the town of Weyburn), which flows into North Dakota and back again to join the Assiniboine river in Manitoba. A small area in the southwest drains to the Missouri river.

Climate.—The southern portion of the province, almost wholly prairie land, has a climate similar to that of Manitoba, with extremes of summer heat and winter cold and a wide mean daily range of temperature reaching 25° to 30° F. The average January temperature in southern Saskatchewan is 0° F., in the north from Lake Athabaska to Reindeer lake —20° F. The ther-

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mometer has recorded -70° F. at Prince Albert. The isothermal lines, as in Alberta and the Yukon, run from northwest to southeast, so that winter and summer averages on the North Saskatchewan river correspond to those of Carcross in the southern part of the Yukon. The July average of 65° F. runs along the southern border of the province, that of 60° F. through the middle. The chinook winds at times mitigate the winter in southern Saskatchewan as far as Regina. The snowfall is from 30 to 35 in. (equals 3- $\frac{1}{2}$ in. of water) and the fall of rain 12 to 15 in., 60% of it in the growing season. But the southern section of the province is subject to seasons of drought and blowing dust. Following the disastrous dry years of the early 1930s, the federal government instituted a water conservation and soil rehabilitation program. In the 1935-50 period the Prairie Farm Rehabilitation act gave financial assistance to 43,042 individual farmers (largely in Saskatchewan) and to 195 communities for the construction of water conservation works (dugouts and small dams). In addition, the federal and the Saskatchewan governments co-operate in major irrigation projects for the dry belt.

Government.—The government of Saskatchewan rests upon the (imperial) British North America act of 1867 and its amendments, the (Canadian) Saskatchewan act of 1905 (4-5 Ed. VII c. 42), together with all preconfederation laws and institutions existing in the Hudson's Bay company territory and not abolished or altered by these acts (including the British common law), all operated under British constitutional conventions. The province is represented at Ottawa by six senators (since 1915) and by members of the house of commons according to population; the 1952 Representation act gave Saskatchewan 17 members. The government at the capital, Regina, consists of a lieutenant governor, appointed and paid by the federal government, a premier and ministry on a constitutional tenure, with a nonpolitical civil service and a legislative assembly of 52 members elected for five years unless the assembly is sooner dissolved. Municipal government began in 1884 with the institution of school districts and elective municipal bodies by the Northwest council (see NORTHWEST TERRITORIES). After 1905 all municipal government depended on provincial statutes. Returns up to 1949 showed elective municipal government in 8 cities, 84 towns and 401 incorporated villages, together with 304 rural municipalities. There are no counties. Public revenue in Saskatchewan, as in all the provinces, is drawn in part from federal subsidies, of less relative importance than in earlier years, and from the newer forms of succession taxes, licences, gasoline taxes and the net revenue from the control of liquor, with income and corporation taxes until World War II, when these two latter forms of taxation were rented to the federal government. Public finance greatly expanded its scope after 1920. In 1916 Saskatchewan had a gross public-bonded debt of \$24,000,000, in 1947 a net direct and indirect public debt of \$157,447,000. The province in its first budget (1905-06) showed a revenue of \$1,441,000, in 1921 of \$11,780,000 and in 1947 of \$56,287,000.

Education.—As throughout Canada, the province controls education except for the remedial power of interference granted to the federal government under the B.N.A. act of 1867 (section 93) for the protection of denominational minorities. In its territorial days Saskatchewan had a small proportion of Roman Catholic elementary schools. Elementary education is public, undenominational, compulsory and free of charge, but there is no prohibition against private denominational schools that satisfy the compulsory requirement. In 1948 the enrolment in provincial day schools was 168,605 and in private day schools 2,710, with 951 students in business colleges. The enrolment in courses of university standard was 8,510. There is a provincial university at Saskatoon, established in 1907, and at Regina a department and minister of education (see also ALBERTA).

Agriculture.—Saskatchewan is the most distinctively agricultural of the Canadian provinces, the net product of its industry in 1948 being officially classed as 76% agricultural (*cf.* all Canada 21%, Ontario 12.5%, Manitoba 47%). This is a consequence of its natural geography and resources, as the province contains, out of its total land area of 237,975 sq.mi., as much as 125,080 sq.mi. of land fit for agriculture, of which only 26,347 sq.mi.

needs clearing. The rest is the open prairie country of the Saskatchewan river basin, unsurpassed throughout the world for large-scale machine agriculture. The raising of spring wheat by this type of farming tops all other occupations. The five-year average, 1943-47, showed 12,977,000 ac. under wheat with a crop of 187,440,000 bu.; compare all Canada five-year wheat (spring and fall), 22,453,000 ac. and 355,018,000 bu., respectively. In Saskatchewan, oats are the second crop: five-year average, 5,230,000 ac. with 144,200,000 bu. (all Canada 402,601,000 bu.).

In other branches of agriculture Saskatchewan falls relatively behind, its agrarian economy resting mainly, whether wisely or not, on one kind of crop. With 52% of the wheat of Canada (1947), it raised only 3% of the total Canadian hay and about 15% of the cows and cattle, 10% of the swine and 15% of the poultry. The climate forbids the commercial growing of apples or other fruits and of tobacco. As in the other prairie provinces, the department of agriculture encourages stock and poultry breeding, distributes seed, aids with pest control measures and carries on educational field work (*see also* under MANITOBA and ALBERTA).

Environment and Settlement.—The population of Saskatchewan is concentrated in the southern one-third of the province. There are two well-marked topographical levels, the lower at about 1,500 ft. above the sea, the upper about 2,500 ft. In the extreme eastern part is the Cretaceous cuesta. The dominant feature in the province is the Missouri coteau (cuesta, or scarp), which to some extent represents the edge of the upper (Tertiary) formations. The Cypress hills and Wood mountain rise well above 3,000 ft. and represent the youngest beds of the Tertiary.

The vegetation belts are well defined in the province. In the southwest corner is a considerable area of grassland, and its northern edge is indicated on the map. Then to the north of this is a transition area called the park land, between the prairie and the boreal forest. Settlement took place fairly rapidly in these two belts, but was proceeding at mid-20th century very slowly in the region north of the park belt, except perhaps to the northwest of Battleford. The first railway, the Canadian Pacific, passed through Broadview, Regina and Swift Current. In those areas the rainfall is about 13 in., which is rather low for regular wheat crops. The Canadian National railway runs to Edmonton along the park belt, where the rainfall is usually slightly more than 15 in. Accordingly, the main population of the province developed along the latter railway route.

The crops and stock are distributed in accord with the rainfall. The yield of wheat is greatest in the Assiniboine valley, and the oats crop and cattle raising are also more important in the eastern portion of the park belt. Up until about the mid-1940s the chief ranches, where grain crops are less important, were naturally to be found in the rather dry areas toward the south, where it took 640 ac. to support an average family. The development of irrigation projects began by the early 1950s to change the dry area agricultural pattern, because with the water 80-ac. farms were able to support a family.

Forests and Fisheries.—The forests of Saskatchewan in the vast woodland of the north are of relatively poor growth and as yet little exploited. The wooded area in 1949 totalled 86,150 sq.mi., of which about half (40,000 sq.mi.) was classed as unproductive; of the other half, 24,000 sq.mi. carried only young growth not yet merchantable. In the centre of the province along the North Saskatchewan there is a heavy stand of spruce, tamarack and jack pine which feeds the lumber industry of Prince Albert. The lumber production of the province (1948; higher during World War II) was 91,228,000 ft.b.m. (*cf.* Canada, 5,908,798,000; British Columbia, 2,937,410,000; Ontario, 760,198,000). Forest industry brings in only 1.3% of the net product of the province.

The large lakes of northern Saskatchewan are well stocked with Great Lakes trout (up to 60 lb.), whitefish and pickerel. Since railway communication was (1951) inadequate for organization and marketing, air transport was largely responsible for their development. The catch was valued (1944) at more than \$1,482,000 for about 12,959,000 lb. of fish sold commercially. These figures, however, reflected wartime food needs, and by 1948 production fell to 8,076,000 lb.

Mines and Minerals.—Formerly the province of Saskatchewan had little place in the output of minerals. But the discoveries and development of the Flin Flon and Sherritt-Gordon ore bodies at the junction of the province with Manitoba altered the situation. The mineral output of 1931 was valued at \$2,114,372, that of 1949 at \$36,054,536, with copper, gold and zinc leading. Lignite coal underlies all southern Saskatchewan and is mainly mined in the Souris valley (1948, 1,589,172 tons).

Water Power.—Of the known available water power of Canada (42,899,000 h.p. at six months' ordinary flow, of which 11,613,333 h.p. was developed up to the end of 1949), Saskatchewan had 1,082,000 h.p. available and 111,835 h.p. developed. The main source is that at Island falls, Churchill river, in use since 1930. Important power sites are offered also on the Red Deer, Saskatchewan and Black rivers. Proposals have frequently been made for the utilization of the North Saskatchewan on a large scale.

Manufacture.—Manufacture plays only a secondary part in the economic life of Saskatchewan, being represented chiefly by manufactures arising out of agriculture or from the forest or those, such as printing and publishing, which must of necessity have a certain local scope. As against 76% of agricultural production, the province had in 1947 a total manufacturing net product of only 7%, including the dependent and localized industries. There were (1939 figures in brackets) 1,001 (737) establishments with 11,723 (6,475) employees producing \$196,452,199 (\$60,650,589). The three largest groups, in terms of production, were flour and feed mills, slaughtering and meat packing, and butter and cheese, accounting for \$101,244,200 (\$47,155,963) of the total. Regina, the capital (pop., 1951, 69,928), has stockyards, abattoirs and packing plants, machine shops, planing and sash mills and assembly plants.

Other centres are Saskatoon (52,732), with the Robin Hood mills and the western plant of Quaker Oats, Moose Jaw (24,336) and Prince Albert (17,067), all distributing centres.

Communications.—The lower portion of the province, from the North Saskatchewan river to the frontier, is well netted with railways. Main trunk lines, the Canadian Pacific heading for Calgary, the Canadian National for Edmonton and the main lines connecting the province with St. Paul, Minn., and Chicago, Ill., are intersected by local feeders. Thus, although the upper half of Saskatchewan is trackless, the province had (1949) a railway mileage of 8,739 (cf. Canada, 42,979; Ontario, 10,463; Alberta, 5,643). The province had (1949) 13,207 mi. (12,647 being gravel) of surfaced motor roads (cf. Ontario, 58,645 mi., 49,737 being gravel). The regular Trans-Canada Air Lines (national) crosses Saskatchewan east and west, while the northern part of the province, as yet without other communication, is dependent upon air craft.

As an inland province Saskatchewan has no seaports, nor have the rivers yet served for anything more than primitive and limited transport. Even in early days the easy transport of the open plains prevented the chief rivers from playing the same part as in eastern Canada. Hence as yet there is no canalization or serious navigation. The federal government expenditures under the harbours and rivers appropriations show nothing for dredging and only an insignificant outlay on local wharves, etc.

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(S. LEA.; C. CY.)

SASKATCHEWAN (RAPID RIVER), a river of Alberta and Saskatchewan provinces, Canada. Two large streams known as the North and South Saskatchewan unite near Prince Albert, and thence flow east into Lake Winnipeg. The North Saskatchewan rises in the Rocky mountains in 52° 07' N. and 117° 06' W. and flows east, receiving several important tributaries, including the Clearwater, Brazeau and Battle. The South Saskatchewan is formed by the union of the Bow and the Belly, the former and larger of which rises in western Alberta in one of the highest districts of the Rockies. Flowing east it receives the waters of the

Red Deer, and farther on turns abruptly north to its junction with the other branch. The length of the united Saskatchewan is 340 mi. The length of the Saskatchewan to the head of the Bow is 1,205 mi. It is little used for navigation.

SASKATOON, second largest city of the province of Saskatchewan, Can., is situated on the banks of the South Saskatchewan river (spanned by six bridges), 160 mi. N.W. of Regina and 466 mi. W. of Winnipeg. From a population of 113 in 1900 it increased to 25,739 in 1921 and 52,732 in 1951. It is an important railway centre for the Canadian Pacific and Canadian National railways and the midwestern headquarters of the latter line. Its central geographical position in the province gives it freight control of about 47,000 sq.mi. of famous wheat country. It is the seat of the University of Saskatchewan, the provincial agricultural school and experiment farm, a provincial normal school and a technical school. Saskatoon is the second largest manufacturing city in the province. The chief industries are the processing of agricultural products, such as flour, cheese, hides and eggs. Secondary manufactures include the making of tractors, garments, beer, glass, barber supplies, metal shingles, bricks and cement blocks. (C. CY.)

SASSAFRAS (*Sassafras albidum*), a North American tree of the laurel family (Lauraceae), called also ague tree, with aromatic bark and foliage. It is native to sandy soils from Maine to Ontario and Iowa and south to Florida and Texas. While usually a small tree, it sometimes attains a height of 80 ft. or more. It has furrowed bark, bright green twigs and entire, mitten-shaped or three-lobed leaves, the three forms often on the same twig. The yellow flowers, borne in small clusters, are followed by dark blue berries.

The root, especially its bark, is used in household medicine and in root beer; it yields oil of sassafras, used in perfumery. (See OREGON MYRTLE; SPICE-BUSH.)

SASSANID or **SASSANIAN DYNASTY** (or SASANIAN), the ruling dynasty of the neo-Persian empire founded by Ardashir I in A.D. 226 and destroyed by the Arabs in 637. The dynasty is named after Sāsān, an ancestor of Ardashir I. (See PERSIA.)

SASSARI, a town and archiepiscopal see of Sardinia, It., capital of the province of Sassari, in the northwest corner of the island, 12½ mi. by rail S.E. of Porto Torres on the north coast, and 21½ mi. N.W. of Alghero on the west coast, 762 ft. above sea level. Pop. (1936) 44,130 (town); 55,373 (commune). The town is modern, with spacious streets and squares. S. Maria di Betlemme has a good façade and Romanesque portal of the end of the 13th century. The museum in the university has an interesting collection of antiquities from all parts of the island, belonging to the prehistoric, Phoenician and Roman periods. Sassari is connected by rail by a branch (28½ mi. E.S.E. to Chilivani) with the main line from Cagliari to Golfo degli Aranci, and with Porto Torres and Alghero. Eleven miles to the east is the Trinità di Saccargia (12th century) with a lofty campanile, one of the finest Pisan churches in the island. The name, in the form Thatari, first occurs in the 12th century A.D. when a church of S. Nicola is mentioned.

The town was in existence in 1217, when a body of Corsicans, driven from their island by the cruelties of a visconti of Pisa, took refuge there and gave their name to a part of it. In 1288, four years after the defeat of Meloria, Pisa ceded Sassari to Genoa; but Sassari enjoyed internal autonomy, and in 1316 published its statutes (still extant), which are perhaps in part the reproduction of earlier ones. In 1323, however, Sassari submitted to the Aragonese king. It was sacked by the French in 1527. During World War II it was bombed by the Allies.

See P. Satta-Branca, *Il Comune di Sassari nei secoli XIII e XIV* (Rome, 1885).

SASSETTA, STEFANO DI GIOVANNI (1392?–1450), Sienese painter of the middle 15th century. The date and place of his birth are not known, but it is believed that he was born in Cortona and that his parents moved to Siena. During the time he was an apprentice, great works of art were being executed in Siena by famous artists whose influence is traced in some of Sassetta's works. His earliest dated work is an altarpiece designed

for a chapel maintained by the Arte della Lana in Siena. Before this was completed he was engaged in the Opera del Duomo, and this connection brought him many important commissions. In 1437 he undertook a series of paintings for the altarpiece of S. Francesco at Borgo Sansepolcro, called the "Apotheosis of Saint Francis."

Sassetta's paintings represent the religious trend of the time. He possessed a unique faculty of developing legend. His paintings show vitality, a facile quality of design and delicate pure colour. Some of his many works survive as fragments, as the chapels in which they had been painted were destroyed by earthquake. One of his best known works is the "Journey of the Magi." Among others, which are scattered, are a polyptych of Asciano, representing the birth of the Blessed Virgin, "St. Francis Before the Soldan," "Adoration of the Magi," and many others. Sassetta's last work, left unfinished, was to have been a fresco of the coronation of the Virgin, painted over the Porta Romana. He died in Siena in 1450.

SASSINA (mod. *Sarsina*), an ancient town of Umbria, Italy, on the left bank of the river Sapis (Savio), 16 mi. S. of Caesena (Cesena). In 266 B.C. both consuls celebrated a triumph over the Sassinates, and in the enumeration of the Italian allies of the Romans in 225 B.C. the Umbri and Sassinates are mentioned, on an equal footing, as providing 20,000 men between them. The poet Plautus was a native of Sassina (b. 254 B.C.). An episcopal see was founded there in the 3rd century A.D. and still exists. The present town has 939 inhabitants (commune, 4,682).

SASOOON, SIR ALBERT ABDULLAH DAVID, BART., cr. 1890 (1818–1896), British Indian philanthropist and merchant, was born at Baghdad on July 25, 1818, a member of a Jewish family settled there since the beginning of the 16th century, and previously in Spain. His father, a leading Baghdad merchant, was driven by repeated anti-Semitic outbreaks to remove from Baghdad to Bushire, Persia, and, in 1832, he settled in Bombay where he founded a large banking and mercantile business. Albert Sassoon was educated in India, and on the death of his father became head of the firm. He was a great benefactor to the city of Bombay, among his gifts being the Sassoon dock, completed in 1875. He died at Brighton, England, on Oct. 24, 1896.

SASTRI, V. S. SRINIVASA (1869–1946), Indian statesman, was born of poor Brahmin parents at Valangiman, near Kumbakonam, Madras, on Sept. 22, 1869. He started life as a schoolmaster, but, deeply impressed by the rules of the Servants of India society which G. K. Gokhale founded in 1905, on a basis of self-sacrifice, purity and poverty, he was admitted to membership early in 1907. On Gokhale's nomination, made before his death in 1915, Sastri succeeded to the presidency. Elected to the viceregal legislative council in 1916, he soon came to the front as the greatest Indian orator of his day. He gave discriminating support to the Montagu-Chelmsford reforms, being a member of the Moderate deputation to England in 1919 and serving on Lord Southborough's Franchise committee; he was elected a member of the new council of state when the reforms took effect. In 1921 he served on the Indian Railway committee; represented India at the Imperial conference in London, at the League of Nations assembly at Geneva, and at the Washington conference on the reduction of naval armaments. The same year he was called to the privy council, being the third Indian to receive this distinction, and was made a freeman of the City of London. In 1922 he was deputed to Australia, New Zealand and Canada to confer with the respective governments as to the best methods of practical interpretation of the resolution of the 1921 Imperial conference on the rights of citizenship of lawfully domiciled Indians, and he achieved definite results. He was chairman of a deputation of nonofficial members of the Indian legislature to London in 1923 to support representations made by the Indians of Kenya on their disabilities, and certain disappointments led him some way in the direction of aloofness; but in 1926 he accepted an invitation to be a member of the Indian delegation to South Africa for a conference with the Union government.

In 1927 Sastri accepted appointment as first agent-general to the government of India in South Africa, with the hearty ap-

proval of Gandhi. During the first session of the round table conference in London (Nov. 17, 1930–Jan. 19, 1931) he was an active member. In 1937 he was appointed by the government of India to inquire on Indian labour conditions in Malay. Sastri died on April 17, 1946, in the Madras presidency.

(F. H. BR.; X.)

SATARA, a town and district of British India, in the Central division of Bombay, 10 mi. from Satara Road station on the Madras and Southern Mahratta railway. The name is derived from the "seventeen" walls, towers and gates which the fort was supposed to possess. The town is 2,320 ft. above sea-level, near the confluence of the rivers Kistna and Vena, 56 mi. S. of Poona. Pop. (1941) 34,548.

The DISTRICT OF SATARA has an area of 4,891 sq.mi. It contains two hill systems, the Sahyadri, or main range of the Western Ghats, and the Mahadeo range and its offshoots. The former runs through the district from north to south, and the latter from east to southeast. The Mahadeo hills are bold, presenting bare scarps of black rock. There are two river systems—the Bhima system in a small part of the north and northeast, and the Kistna system throughout the rest of the district. The hill forests have a large store of timber and firewood. The soil is a black loamy clay containing carbonate of lime, which is very fertile when well watered. Satara contains some important irrigation works, including the Kistna canal. In some of the western parts of the district the average annual rainfall exceeds 200 in.; but on the eastern side water is scanty. The population in 1941 was 1,327,249. The principal crops are millet, pulse, oilseeds and sugar cane. The only manufactures are cotton cloth, blankets and brassware. The district is traversed from north to south by the Madras and Southern Mahratta railway, passing 10 mi. from Satara town. The Satara agency comprises the two feudatory states of Phaltan and Aundh (*q.v.*).

On the overthrow of the Jadhav dynasty in 1312 the district passed to the Mohammedan power, which was consolidated in the reign of the Bahmani kings. On the decline of the Bahmanis toward the end of the 15th century the Bijapur kings finally asserted themselves, and under these kings the Mahrattas arose and laid the foundation of an independent kingdom with Satara as its capital. The Peshwas, who removed the capital to Poona and degraded the rajah, got the ascendancy in the 18th century, but after the war of 1817 the British restored the rajah, and assigned to him the principality of Satara, with an area much larger than the present district. In consequence of political intrigues he was deposed in 1839, and his brother, who took his place, died without male heirs in 1848, when the state was resumed by the British government.

SATEEN, a term of modern usage derived from "satin" (*q.v.*). The term "sateen" is employed more especially to distinguish cotton textures that are based on the satin weave principle of fabric structure from those of the true "satin" fabrics produced from pure silk.

SATELLITE, in astronomy, a small opaque body revolving around a planet, as the moon around the earth (see PLANET and the articles on individual planets). In the theory of cubic curves, Arthur Cayley defined the satellite of a given line to be the line joining the three points in which tangents at the intersections of the given (primary) line and curve again meet the curve.

SATIE, ERIK LESLIE (1866–1925), French composer, was born at Honfleur on May 17, 1866 (his mother being an Englishwoman), and studied at the Paris conservatoire. His early works proclaimed a persistent determination to be original, and were followed by a series of equally eccentric pianoforte pieces. He exercised influence, nonetheless, upon many of his younger French contemporaries of the "advanced" school, who hailed him as a prophet. But the public at large saw in him something of the *farceur*, and his interesting attempts to be daring did not seem to be accompanied by any commensurate genuine talent.

See A. Coeuroy, *La Musique française moderne* (Paris, 1922).

SATIN, a term strictly denoting a true silk texture developed with a perfectly even, smooth and glossy or lustrous surface on which either warp or weft threads preponderate and

thus entirely obscure the other series of threads. The principle of fabric structure observed in the construction of satin fabrics is that known as the "satin" weave, which constitutes one of the simplest elementary weaves in which the intersections of the warp and weft threads are so evenly and perfectly distributed that there are no pronounced textural features discernible in the fabric, as the threads, either of warp or of weft only, are displayed on the surface with the least possible amount of deflection by their interlacement with the threads of the other system.

A true silk satin fabric may be produced either with a warp surface or a weft surface of pure silk, with the reverse side of cotton or other textile material. In either case, the silk requires to be of the best quality and perfectly even.

The term "satin," however, is now applied as a general description for many fabrics (other than those composed of pure silk), constructed on the principle of the satin weaves. For example, cotton fabrics constructed on the satin-weave basis are described as "satin" or "sateen" according to whether they are developed with a warp surface or a weft surface, respectively. It is also applied indiscriminately to many other varieties of fabrics having a smooth and lustrous finish. (For Satinet see SATEEN.)

(H. N.)

SATIN-SPAR, a name given to certain fibrous minerals which exhibit, especially when polished, a soft satiny or silky lustre, and are therefore sometimes used as ornamental stones. Such fibrous minerals occur usually in the form of veins or bands, having the fibres disposed transversely. The most common kind of satin-spar is a white finely-fibrous gypsum not infrequently found in the Keuper marls of Nottinghamshire and Derbyshire, and used for beads, etc. Other kinds of satin-spar consist of calcium carbonate, in the form of either aragonite or calcite, these being distinguished from the fibrous gypsum by greater hardness and effervescence with acids and from each other by specific gravity and optical characters. The satin-spar of Alston, Cumberland, is a finely-fibrous calcite occurring in veins in a black shale of the Carboniferous series.

SATIN-WOOD, a beautiful light-coloured hard wood, having a rich, silky lustre, sometimes finely mottled or grained, the produce of a moderate-sized tree, *Chloroxylon Swietenia* (family Meliaceae), native of India and Ceylon. A similar wood, known under the same name, is obtained in the West Indies, the tree being probably a species of *Xanthoxylum* (family Rutaceae). Satin-wood was in request for rich furniture about the end of the 18th century, the fashion then being to ornament panels of it with painted medallions and floral scrolls and borders. It is used for inlaying and small veneers.

SATIRE, in its literary aspect, may be defined as the expression in adequate terms of the sense of amusement or disgust excited by the ridiculous or unseemly, provided that humour is a distinctly recognizable element, and that the utterance is invested with literary form. Without humour, satire is invective; without literary form, it is mere clownish jeering. The first exercise of satire no doubt consisted in gibing at personal defects. To dignify satire by rendering it the instrument of morality or the associate of poetry was a development implying considerable advance in the literary art. In the accounts that have come down to us of the writings of Archilochus, the first great master of satire, we seem to trace the elevation of the instrument of private animosity to an element in public life. Simonides of Amorgus and Hipponax were distinguished like Archilochus for the bitterness of their attacks on individuals, with which the former combined a strong ethical feeling and the latter a bright active fancy. The loss of their writings, which would have thrown great light on the politics as well as the manners of Greece, is to be lamented. With Hipponax the direct line of Greek satire is interrupted; but two new forms of literary composition, capable of being the vehicles of satire, almost simultaneously appear. Although the original intention of fable does not seem to have been satirical its adaptability to satiric purposes was soon discovered. A far more important step was the elevation of the rude fun of rustic merrymakings to a literary status by the evolution of the drama from the Bacchic festival. The means had now been found of allying the

satiric spirit with exalted poetry, and their union was consummated in the comedies of Aristophanes.

A rude form of satire had existed in Italy from an early date in the shape of the Fescennine verses, the rough and licentious pleasantry of the vintage and harvest. As in Greece, these eventually were developed into a rude drama. Verse, "like to the Fescennine verses in point of style and manner," was added to accompany the mimetic action, and these probably improvised compositions were entitled *Satyræ*, a term denoting *miscellany*, and derived from the *satura lanx*, "a charger filled with the first-fruits of the year's produce."

The Roman people thus had originated the name of satire; and, in so far as the Fescennine drama consisted of raillery and ridicule, possessed the thing also; but it had not yet assumed a literary form among them. The real inventor of Roman satire is Gaius Lucilius (148–103 B.C.). The fragments of Lucilius preserved are scanty, but the verdict of Horace, Cicero and Quintilian demonstrates that he was a considerable poet. It is needless to dwell on compositions so universally known as the *Satires* of Lucilius's successor Horace, in whose hands this class of composition received a new development, becoming genial, playful and persuasive. The didactic element preponderates still more in the philosophical satires of Persius. Yet another form of satire, the rhetorical, was carried to the utmost limits of excellence by Juvenal, the first example of a great tragic satirist. Nearly at the same time Martial, improving on earlier Roman models now lost, gave that satirical turn to the epigram which it only exceptionally possessed in Greece, but has ever since retained. About the same time another variety of satire came into vogue, destined to become the most important of any. The Milesian tale, a form of entertainment probably of Eastern origin, grew in the hands of Petronius and Apuleius into the satirical romance, immensely widening the satirist's field and exempting him from the restraints of metre. Petronius's "Supper of Trimalchio" is the revelation of a new vein, never fully worked till our days. As the novel arose upon the ruins of the epic, so dialogue sprang up upon the wreck of comedy. In Lucian comedy appears adapted to suit the exigencies of an age in which a living drama had become impossible. With him antique satire expires as a distinct branch of literature.

In the Byzantine empire, indeed, the link of continuity is unbroken, and such raillery of abuses as is possible under a despotism finds vent in pale copies of Lucian. The first really important satire, however, of the middle ages, is a product of western Europe, recurring to the primitive form of fable, upon which, nevertheless, it constitutes a decided advance. *Reynard the Fox* (see FABLE), a genuine expression of the shrewd and homely Teutonic mind, is a landmark in literature. It gave the beast-epic a development of which the ancients had not dreamed. About the same time, probably, the popular instinct, perhaps deriving a hint from Rabbinical literature, fashioned Morolf, the prototype of Sancho Panza, the incarnation of sublunar mother-wit contrasted with the starry wisdom of Solomon; and the *Till Eulenspiegel* is a kindred Teutonic creation, but later and less significant. *Piers Ploughman*, the next great work of the class, adapts the apocalyptic machinery of monastic and anchoritic vision to the purposes of satire. The clergy were scourged with their own rod by a poet and a Puritan too earnest to be urbane. The Renaissance, restoring the knowledge of classic models, enlarged the armoury of the satirist. Partly, perhaps, because Erasmus was no poet, the Lucianic dialogue was the form in the ascendant of his age. Erasmus not merely employed it against superstition and ignorance with infinite and irresistible pleasantry, but fired by his example a bolder writer, untrammelled by the dignity of an arbiter in the republic of letters. The ridicule of Ulric von Hutten's *Epistolæ obscurorum virorum* is annihilating, and the art of putting the ridicule into the mouth of the victim, is perhaps the most deadly shaft in the quiver of sarcasm. It was afterwards used with even more pointed wit though with less exuberance of humour by Pascal. Sir Thomas More cannot be accounted a satirist, but his idea of an imaginary commonwealth embodied the germ of much subsequent satire.

In the succeeding period politics take the place of literature and

religion, producing in France the *Satyre Ménippée*, elsewhere the satirical romance as represented by the *Argenis* of Barclay, which may be defined as the adaptation of the style of Petronius to State affairs. In Spain, where no freedom of criticism existed, the satiric spirit took refuge in the *novela picaresca*, the prototype of "Le Sage and the ancestor of Fielding; Quevedo revived the mediaeval device of the vision as the vehicle of reproof; and Cervantes's immortal work might be classed as a satire were it not so much more. About the same time we notice the appearance of direct imitation of the Roman satirists in English literature in the writings of Donne, Hall and Marston. The prodigious development of the drama at this time absorbed much talent that would otherwise have been devoted to satire proper. Most of the great dramatists of the 17th century were more or less satirists, Molière perhaps the most consummate that ever existed; but, with an occasional exception like *Les Précieuses ridicules*, the range of their works is too wide to admit of their being regarded as satires. The next great example of unadulterated satire is Butler's *Hudibras*. Dignified political satire, bordering on invective, was carried to perfection in Dryden's *Absalom and Achitophel*. In France Boileau was long held to have attained the *ne plus ultra* of the Horatian style in satire and of the mock-heroic, but Pope was soon to show that further progress was possible in both. The polish, point and concentration of Pope remain unsurpassed, as do the amenity of Addison and the daring yet severely logical imagination of Swift; while the *History of John Bull* places their friend Arbuthnot in the first rank of political satirists.

The 18th century was, indeed, the age of satire. Serious poetry had for the time worn itself out; the most original geniuses of the age are decidedly prosaic, and Pope, though a true poet, is less of a poet than Dryden. In process of time imaginative power revives, but meanwhile Fielding and Smollett have fitted the novel to be the vehicle of satire and much beside, and the literary stage has for a time been almost wholly engrossed by a colossal satirist, a man who has dared the universal application of Shaftesbury's maxim that ridicule is the test of truth. The world had never before seen a satirist on the scale of Voltaire, nor had satire ever played such a part as a factor in impending change. As a master of sarcastic mockery he is unsurpassed; his manner is entirely his own; and he is one of the most intensely national of writers, notwithstanding his vast obligations to English humorists, statesmen and philosophers. English humour also played an important part in the literary regeneration of Germany, where Lessing, imbued with Pope but not mastered by him, showed how powerful an auxiliary satire can be to criticism. Another great German writer, Wieland, owes little to the English, but adapts Lucian and Petronius to the 18th century with playful if somewhat mannered grace. Goethe and Schiller, Scott and Wordsworth, are now at hand, and as imagination gains ground satire declines. Byron, who in the 18th century would have been the greatest of satirists, is hurried by the spirit of his age into passion and description, bequeathing, however, a splendid proof of the possibility of allying satire with sublimity in his *Vision of Judgment*. Two great satiric figures remain—one representative of his nation, the other most difficult to class. In all the characteristics of his genius Thackeray is thoroughly English; his satire is a thoroughly British article, a little solid, a little wanting in finish, but honest, weighty and durable. But Heine hardly belongs to any nation or country, time or place. In him the satiric spirit, long confined to established literary forms, seems to obtain unrestrained freedom.

In no age was the spirit of satire so generally diffused as in the 19th century, but many of its eminent writers, while bordering on the domains of satire, escape the definition of satirist. The term cannot be properly applied to Dickens, the keen observer of the oddities of human life; or to George Eliot, the critic of its emptiness when not inspired by a worthy purpose; or to Balzac, the painter of French society; or to Trollope, the mirror of the middle classes of England. If *Sartor Resartus* could be regarded as a satire, Carlyle would rank among the first of satirists; but the satire, though very obvious, rather accompanies than inspires the composition. The number of minor satirists of merit, on the other hand, is legion. James Russell Lowell's, *Biglow Papers*

represent perhaps the highest moral level yet attained by satire. Mallock, in his *New Republic*, made the most of personal mimicry, the lowest form of satire; Samuel Butler (*Erewhon*) holds an inverting mirror to the world's face with imperturbable gravity; the humour of Bernard Shaw has always an essential character of satire—the sharpest social lash. One remarkable feature of the modern age is the union of caricature (*q.v.*) with literature.

(R. G.; X.)

SATISFACTION, reparation for an injury or offence; payment, pecuniary or otherwise, of a debt or obligation; particularly, in law, an equitable doctrine of much importance. In English law, as between strangers, it was laid down in *Talbot v. Duke of Shrewsbury*, 1714, Pr. Ch. 394, that where a debtor bequeaths to his creditor a legacy as great as, or greater than the debt, the legacy shall be deemed a satisfaction of the debt. If the debt was incurred after the execution of the will, there is no satisfaction, nor is there where the will giving the legacy contains a direction to pay debts. As between parent and child, the doctrine operates (*a*) in the satisfaction of legacies by portions, and (*b*) of portions by legacies. In the case of (*a*), it has been laid down that where a parent, or one acting *in loco parentis*, gives a legacy to a child, without stating the purpose for which he gives it, it will be understood as a portion; and if the father afterwards advance a portion on the marriage, or preferment in life, of that child, though of less amount, it is a satisfaction of the whole, or in part. This application of the doctrine is based on the maxim that "equality is equity," as is also the rule (*b*) that where a legacy bequeathed by a parent, or one *in loco parentis*, is as great as, or greater than, a portion or provision previously secured to the child, a presumption arises that the legacy was intended by the parent as a complete satisfaction. In the United States some jurisdictions refuse to presume that a gift to a creditor is intended as a satisfaction of a debt. The testator's intention that the bequest shall operate as a satisfaction of the debt must appear upon the face of the will. A few States have abolished the doctrine of satisfaction by statute. (See ACCORD and LEGACY. For the theological meaning see ATONEMENT.)

SATPURA, a system of hills in the centre of India. Beginning at the lofty plateau of Amarkantak, the range extends westward almost to the west coast. From Amarkantak an outer ridge runs south-west for about 100 m. to the Saletekri hills in Balaghat district. As it proceeds westward the range narrows from a broad tableland to two parallel ridges enclosing the valley of the Tapti, as far as the famous hill-fortress of Asirgarh. Beyond this point the Khandesh hills, which separate the valley of the Narbada from that of the Tapti, complete the chain as far as the Western Ghats. The mean elevation is about 2,500 ft.; but the plateaux of Amarkantak and Chauradar in the east of Mandla district rise to nearly 3,500 ft., and many of the peaks and some of the table-lands exceed this altitude. Just east of Asirgarh there is a break in the range, through which passes the railway from Bombay to Jubbulpore, the elevation at this point being about 1,240 ft. The length of the system is about 600 m.

SATRAE, in ancient geography, a Thracian people, inhabiting part of Mount Pangaeus between the rivers Nestus (Mesta) and Strymon (Struma). According to Herodotus (vii. 110–112), they were independent in his time, and had never been conquered within the memory of man. They dwelt on lofty mountains, and on the highest of these was an oracle of Dionysus, whose utterances were delivered by a priestess. They were the chief workers of the gold and silver mines in the district. Herodotus is the only ancient writer who mentions the Satrae, and Tomaschek regards the name not as that of a people but of the warlike nobility among the Thracian Dii and Bessi. J. E. Harrison and others identify them with the Satyri (Satyrs), the attendants and companions of Dionysus, and also with the Centaurs.

See J. E. Harrison, *Prolegomena to the Study of Greek Religion* (1903), p. 379; W. Tomaschek, *Die alten Thraker* (1893).

SATRAP, in ancient history, the name given by the Persians to the governors of the provinces; Pers. *Kshatrapāvan*, i.e., "protector (superintendent) of the country (or district)," Heb. *sakhshadapan*, Gr. *εξατράπης* (insc. of Miletus, *Sitzungsber.*

Berl. Ak., 1900, 112), ἔξαρπατεών (in sc. of Mylasa, Dittenberger, Sylloge, 3rd ed., 167) ἔξαρπάτης (in sc. of Mylasa, Lebas, iii. 388, Theopomp, p. 111), shortened into σαρπάτης. By the earlier Greek authors (Herodotus, Thucydides, and often in Xenophon) it is rendered by ὑπαρχος "lieutenant, governor," in the documents from Babylonia and Egypt and in Ezra and Nehemiah by *pakha*, "governor"; and the satrap Mazaeus of Cilicia and Syria in the time of Darius III. and Alexander (Arrian, iii. 8) calls himself on his coins "Mazai, who is [placed] over the country beyond the Euphrates and Cilicia." Cyrus the Great divided his empire into provinces; a definitive organization was given by Darius, who established twenty great satrapies and fixed their tribute (Herodot. iii. 89, sqq.). The satrap was the head of the administration of his province; he collected the taxes, controlled the local officials and the subject tribes and cities, and was the supreme judge of the province to whose "chair" (Nehem. iii. 7), every civil and criminal case could be brought. He was responsible for the safety of the roads (*cf.* Xenophon, *Anab.*, i. 9. 13), and had to put down brigands and rebels. He was assisted by a council of Persians, to which also provincials were admitted; and was controlled by a royal secretary and by emissaries of the king (esp. the "eye of the king"). The regular army of his province and the fortresses were independent of him and commanded by royal officers; but he was allowed to have troops in his own service (in later times mostly Greek mercenaries). The great provinces were divided into many smaller districts, the governors of which are also called satraps and hyparchs. The distribution of the great satrapies was changed occasionally, and often two of them were given to the same man. When the empire decayed, the satraps often enjoyed practical independence, especially as it became customary to appoint them also as generals-in-chief of their army district, contrary to the original rule. Hence rebellions of satraps became frequent from the middle of the 5th century; under Artaxerxes II. occasionally the greater part of Asia Minor and Syria were in open rebellion. The last great rebellions were put down by Artaxerxes III. The satrapic administration was retained by Alexander and his successors, especially in the Seleucid empire, where the satrap generally is designated as *strategus*; but their provinces were much smaller than under the Persians.

See further PERSIA: History: Ancient, from the Achaemenid period onwards, and works there quoted.
(Ed. M.)

SATRICUM (mod. *Conca*), an ancient town of Latium, situated on a low hill surrounded by cliffs, about 30 mi. to the S.E. of Rome, in a low-lying region to the south of the Alban hills, to the north-west of the Pomptine marshes. It was accessible direct from Rome by a road running more or less parallel to the Via Appia, to the south-west of it. It was a member of the Latin league of 490 B.C. and became Volscian in 488.

SATUN or **SETUL**, a small Siamese (Thai) changrad or district bordering Malaya. Area 1,192 sq.mi.; pop. (1947) 46,514. It produces rice and rubber.

SATURN, SATURNUS, SAETURNUS, a Roman god of sowing, or of seed-corn (*Satus*), identified with Cronus (*q.v.*), for reasons no longer apparent. His cult was so over-laid with Greek features that almost nothing is known of its original form. His cult-partner was the very obscure goddess *Lua* (*lues*, plague or destruction); she was amongst other things a fire-goddess in whose honour spoils were sometimes burned (*see* Rose in *Class. Rev.*, xxxvi, p. 15 *et seq.*). But, since for some reason Ops, the cult-partner of *Consus* (*q.v.*) became identified with Rhea, Saturn is often associated with her.

His temple stood at the foot of the *clivus Capitolinus* leading from the Forum, where the ruins of a late restoration of it are still visible. It contained the Republican treasury (*aerarium Saturni*). The statue had woollen bands around its feet, probably to keep it from running away (so at Sparta the statue of Enyalius the war-god was fettered, and there are plenty of savage parallels), *see* Macrob. *Saturn*, i. 8, 5; this too is Greek, for cult-statues are not native Roman. Also the worship was *Graeco ritu*, *i.e.*, with the head uncovered, not wrapped in the toga as was the Roman custom. His great festival was the *Saturnalia*, originally Dec. 19, but gradually extended to seven days. We may conjecture that it

was connected with the winter sowing, which in modern Italy lasts in various districts from October to January. Be that as it may, in historical times it was a most lively popular festival, probably modelled on the Greek *Kronia* (*see* *CRONUS*). All business, public and private, was at a standstill; schools were closed, executions and military operations did not take place, slaves were temporarily free, feasting with and even waited on by their masters, and saying what they chose. All and sundry were greeted with *io Saturnalia*, and presents were freely exchanged, the traditional ones being wax candles and little clay dolls. Concerning these, the antiquaries had a quaint story that an old prophecy bade the earliest inhabitants of Latium send *φῶτα* to Saturn and heads to Pluto; that they interpreted this as meaning human sacrifices, but that Hercules (*q.v.*) advised them to use lights (the word *Φῶτος* means "light" or "man" according to accentuation) and not human "heads" (Macrob., *op. cit.*, i. 7, 31). Gambling with dice, generally forbidden, was allowed, a custom which is exactly paralleled from Nepal (Oldfield, *Sketches from Nepal*, ii. p. 353 *et seq.*). Saturnus himself was untied, presumably to come out and join in the fun.

Saturni dies (Saturday) occurs first in Tibullus, F., 3, 18, *see* Colson, *The Week*, pp. 15, 16, 35.

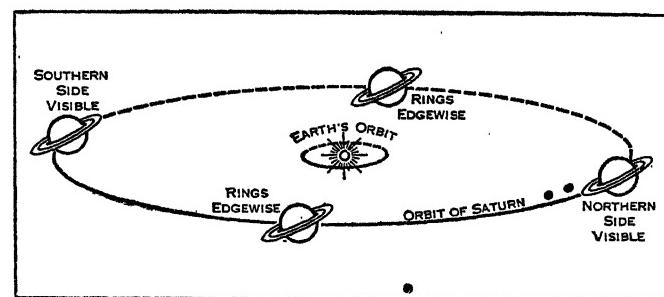
See W. Warde Fowler, *Roman Festivals*; G. Wissowa, *Religion u. Kultus* (2nd ed. 1912), p. 204 *et seq.*, and in Roscher's *Lexikon* (*s.v.*).

SATURN (\S) is the sixth major planet in order of distance from the sun, and is the most remote planet that was known before the discovery of Uranus in 1781. Its mean distance from the sun is about 885,900,000 mi. and its periodic time about 29½ years. Its synodic period, or the interval between oppositions, is 378 days. To the naked eye, Saturn, when in opposition, always appears as a star brighter than the first magnitude, but in consequence of the changing phases of its rings it varies greatly in brightness, its light being approximately trebled when the rings are open to their greatest extent. As regards colour, the planet shines with a warm, yellowish light not unlike that of Arcturus.

The Globe.—In telescopic appearance the globe of Saturn exhibits strong resemblances to Jupiter. It is even more flattened at the poles, its polar and equatorial diameters being respectively about 67,000 and 75,000 mi.; it is less bright near the margin than at the centre of the disc, and its surface is marked by dusky belts with light intermediate zones; but whereas these cloudlike bands are very conspicuous on Jupiter, they are usually feeble and ill-defined in the case of Saturn.

The volume of Saturn is about 750 times that of the earth, but the periodic times of its satellites show that it exceeds the earth only about 95 times in mass. Its mean density, therefore, is but 0.13 of that of the earth, or about 0.7 times that of water.

Rotation.—Owing to the difficulty of detecting individual fea-



FROM ASTRONOMY BY R. H. BAKER (D. VAN NOSTRAND COMPANY, INC.)
PHASES OF SATURN'S RINGS

tures of a sufficiently definite nature, the rotation of the planet has been observed only on comparatively rare occasions. The first determination was made in 1794 by the elder Herschel, who derived a rotation period of 10 hr. 16 min. In Dec. 1876 a bright spot appeared near the equator which was observed by Asaph Hall, at Washington, for more than a month, and which showed a rotation in 10 hr. 14 min. 24 sec. In 1893 and 1894 A. S. Williams deduced from observations of dark spots in the northern hemisphere mean rotation periods of 10 hr. 14 min. 45 sec. and 10 hr. 15 min. 10 sec. respectively, and in the same two years periods of 10 hr.

SATURN

12 min. 52 sec. and 10 hr. 12 min. 36 sec. from a number of white equatorial spots.

In 1933 a very conspicuous bright spot was discovered near the equator of Saturn by W. T. Hay. Observations by William H. Wright at the Lick observatory showed that the period of rotation of the equatorial region of Saturn as determined from this spot agreed very closely with the value obtained much earlier by Asaph Hall. Spectrographic observations by Joseph H. Moore of the Lick observatory in 1936-37 confirmed the earlier discovery that the rotation period of Saturn becomes longer with increasing distance from its equator; in this respect Saturn resembles Jupiter. This results in a continual lagging behind of regions in high latitudes compared with those near the equator.

Physical Condition.—It is now clear that what we see of Saturn is not a solid surface, but a layer of cloudlike or vaporous matter; the mean density of the globe is, indeed, less than that of any other major planet, and it is further to be noted that considerations based on the large ellipticity of the disk, which is greater than would be assumed by such a globe of anything like uniform density rotating with the angular velocity of Saturn, indicate that the larger part of the planet's mass must be strongly concentrated towards the centre.

Radiometric observations made by William W. Coblenz and Carl O. Lampland indicate that the temperature of the surface is very low, of the order of -150° C. A second major discovery has been the identification of the red and infra-red bands in the spectra of the outer planets with the compounds ammonia and methane. The identification was suggested by Rupert Wildt in 1932 and was definitely established a short time later by Theodore Dunham at Mount Wilson. The atmosphere of Saturn thus seems to consist, according to these investigators, of clouds of ammonia gas and crystals, methane, and hydrogen. Underneath there may be a layer of ice, while the dense core itself probably consists of rocky metallic material.

The Rings.—But Saturn's most remarkable feature and that which renders it unique, so far as our knowledge goes, is the magnificent system of rings by which it is surrounded. That Saturn differs in appearance from other bodies was seen at once by Galileo when he turned his little telescope towards it in 1610, but his instrument was not sufficiently powerful to reveal the nature of what he saw. He noticed that the planet had a small attendant on each side, and accordingly represented it as a triple body. But during the next few years the appendages dwindled and finally disappeared, greatly to his perplexity and chagrin, as he feared he must have been misled by some kind of illusion. When they subsequently reappeared they continued to present a difficult problem to the telescopic observers of the day—sometimes seeming like arms stretching out on each side of the central body and sometimes like curved handles—and a number of curious drawings have come down to us which show how puzzled the observers were, but how near some of them came to the solution of the mystery.

The true explanation was ultimately arrived at by Christian Huygens in 1655, but, wishing for further time to make sure of his solution and yet secure himself against the possible loss of priority in the discovery, he published the following series of letters:—aaaaaaa ccccc d eeeee g h iiiiiii llll mm nnnnnnnn ooooo pp q rr s tttt uuuu; which, when properly arranged, form the sentence:—"Annulo cingitur, tenui, plano, nusquam cohaerente, ad eclipticam inclinato" (It is girdled by a thin flat ring, nowhere touching, inclined to the ecliptic). These last few words explain the various appearances which so sorely puzzled the earlier observers with their imperfect instruments. The plane of the ring is inclined about 27° to the planet's orbit, and about 28° to the ecliptic, and keeps parallel to itself throughout the planet's revolution.

There are accordingly two opposite portions of the orbit, viz., near longitudes 172° and 352° , where Saturn is in Leo and Aquarius respectively, at which the ring can be presented edge-wise to the earth and when this event happens (as it does either once or three times during each passage of the ring plane across the earth's orbit) the ring—owing to its thinness—disappears

from view even in powerful instruments. At intermediate positions, viz., when the planet is in Taurus and Gemini and in Sagittarius, it appears opened out at an angle of 27° , and is then seen to project slightly beyond the polar diameter of the planet's globe. The next important telescopic discovery as regards Saturn was the detection by G. D. Cassini, in 1675, of a black line or gap dividing the ring into two concentric rings. This is generally known as "Cassini's division." The ring exterior to this division is narrower and less bright than the inner ring, while the outer portion of the latter is the most brilliant part of the whole system.

Within the second ring is yet another feature of great interest, viz., a third ring, commonly known as the Crape ring, of which the brightness is so feeble that it long escaped detection. It was first recorded by Johann G. Galle, at Berlin, in 1838, but its existence was strangely forgotten till it was independently rediscovered, in 1850, by G. P. Bond at Harvard and W. R. Dawes in England. It can be readily traced with a comparatively small telescope as a dusky band where it crosses the planet's globe, but is not so easily seen in the portions projected against the dark sky. The three rings are often denoted by the letters A, B and C. From time to time other divisions besides that of Cassini have been reported, but they seem to have been merely partial and temporary, except that known as "Encke's division," in ring A, which is, perhaps, permanent, though probably not really a complete division. It usually appears as a pencil-like shading rather than a sharp black line and sometimes merely as the boundary of the darker outer portion of the ring. The figures given by different authorities for the dimensions of the ring system differ somewhat, but the following are approximately correct:

Ring	Exterior diameter in miles	Breadth of ring in miles
A :	170,000	10,000
B :	145,000	16,000
C :	113,000	11,000

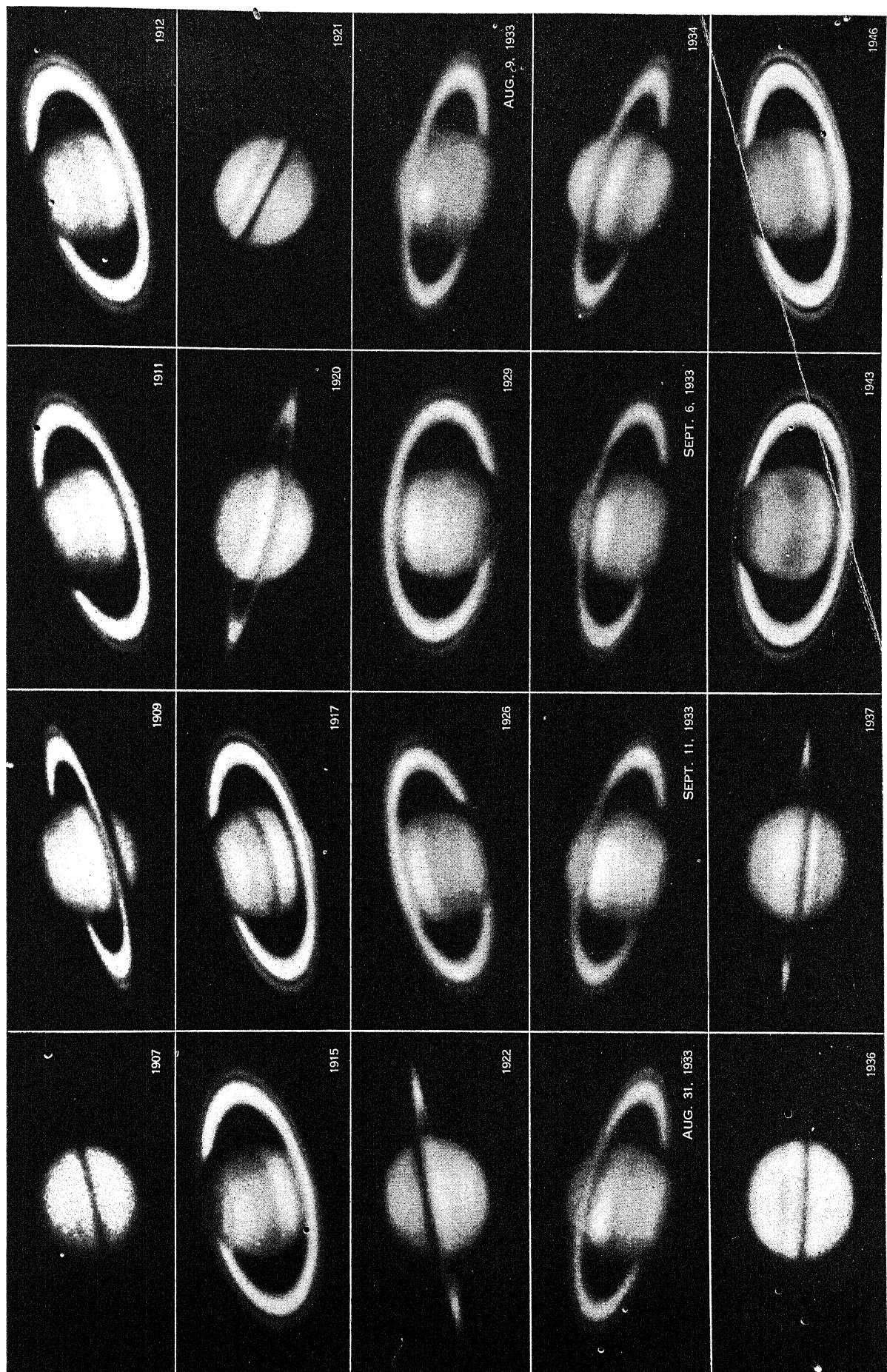
The breadth of the Cassini division is probably rather more than 2,000 miles. The thickness of the rings is of the order of 10 mi. or less. It is noteworthy that all three are at least partly transparent; Saturn itself can be distinctly seen through the Crape ring and on some recent photographs it also shows through the outer ring. Moreover, on Feb. 9, 1917, M. A. Ainslie, at Blackheath, and J. Knight, at Rye, observed that a seventh magnitude star remained visible during its occultation by the outer ring, though Ainslie considered that it lost something like three-fourths of its light; it appeared to travel some distance along the Cassini division but did not pass behind ring B; and on March 14, 1920, during the occultation of another seventh magnitude star, the star remained conspicuously visible in a 6-in. refractor at W. Reid's observatory, Rondebosch, South Africa, even when behind the brightest part of ring B and despite the fact that, in consequence of the obliqueness of the line of sight, its light had to traverse a distance through the ring equal to eight times its real thickness.

The translucency of the ring system is also shown by the fact that it can be faintly seen against the sky as a narrow line of light on the occasions—sometimes extending over several weeks near the time of disappearance—when the plane of the rings passes between the sun and the earth. On this line of light two condensations are seen on each side of the planet, corresponding in position with the Cassini division and the Crape ring. They are apparently caused by the larger amount of sunlight transmitted at those places where the ring material is absent or relatively thin. The ring, as a whole, however, is sufficiently dense to cast a strong shadow, which is seen at such times as a narrow black band across the planet's equatorial regions.

The physical constitution of the rings is unlike that of any other object in the solar system. They are not formed of a continuous mass of solid or liquid matter, but of discrete particles of unknown minuteness, probably widely separated in proportion to their individual volumes, yet so close as to appear continuous when viewed from the earth. This constitution was first divined

SATURN

PLATE



BY COURTESY OF DR. E. C. SLIPHER

SATURN

Various aspects of the planet and its ring system (1907-46). In 1907, 1921 and 1936 the rings were edgewise and thus too faint to be seen in normal exposures; in 1915, 1925 and 1943 the rings were wide open. The great white spot of 1933 is shown on Aug. 9 and Aug. 31 almost unchanged, but on Sept. 11 it had rapidly expanded until it extended about 3/5 the way across the ball. The photograph of Sept. 6, 1933, shows the outburst of still another large white spot more than 100° in longitude following the first.

by J. Cassini early in the 18th century. But, although the impossibility that a continuous ring could surround a planet without falling upon it was shown by Pierre S. de Laplace and must have been evident to all investigators in celestial mechanics, Cassini's explanation was forgotten until 1857. In that year James Clerk Maxwell, in an essay which was the first to gain the newly-founded Adams prize of the University of Cambridge, made an exhaustive mathematical investigation of the satellite constitution, showing that it alone could fulfil the conditions of stability. In the light of this demonstration, it was of great interest when J. E. Keeler, at the Allegheny Observatory, proved this constitution by spectroscopic observation in 1895. He found, by measuring the velocity of different parts of the ring to or from the earth, that, as we pass from its outer to its inner regions, the velocity of revolution around the planet increases, each concentric portion having the speed belonging to a satellite revolving in a circular orbit at the same distance from the planet. The relative velocities of different parts of the system are beautifully shown by the slope of the lines in a spectrogram of Saturn made by V. M. Slipher of the Lowell Observatory.

Satellites.—Saturn is attended, so far as is at present known, by nine satellites. A tenth (Themis) was announced by W. H. Pickering in 1905, but its actual existence has not been satisfactorily confirmed. Details of the satellites are given in the table below.

The diameters assigned by observers to the smaller and fainter satellites are necessarily very uncertain, but that of Titan is probably not far from 3,000 miles. The diameter of Phoebe is,

ena of celestial mechanics. Iapetus has the peculiarity of always appearing brighter when seen to the west than to the east of the planet; this is explained by the supposition that, like our moon, this satellite always presents the same face to the central body.

Phoebe, the outermost satellite, is more than three and one-half times as remote from Saturn as Iapetus, and the circumstances of its discovery are interesting. In studying photographs of the neighbourhood of Saturn taken at Arequipa Observatory, Peru, Pickering found on each of three plates a very faint star which was missing on the other two. He concluded that these were the images of a satellite moving around the planet, which was then entering the Milky Way, where minute stars were so numerous that it was not easy to confirm the discovery. When Saturn began to emerge from the Milky Way no difficulty was found in relocating the object and proving that it was a ninth satellite. Its motion, however, was found to be retrograde or in a contrary direction to that of the other satellites. This difference of motion in a single system was, according to the knowledge of that time, a unique phenomenon, for although the satellites of Neptune and those of Uranus were known to have retrograde motions, they are the only satellites of those planets hitherto discovered. But more recently the eighth, ninth and eleventh satellites of Jupiter have been found and the motion of these, like that of Phoebe, is retrograde. (T. E. R. P.; W. W. M.)

SATURNIAN METRE [Lat., *Saturnius*, see SATURN], a native Italian metre, used in some of the oldest known Latin compositions. It was in later times wholly displaced by Greek metres and but few specimens survive. These are (1) inscrip-

Name	Distance in equatorial radii of Saturn ($i = 37.500$ mi.)	Period of revolution	Inclination of orbit to Saturn's orbit	Eccentricity	Stellar mag. at mean opposition	Discoverer	Date of discovery
Mimas	3.1	o 22.6	o 26 44.7	0.0190	12.1	W. Herschel	1789, Sept. 17
Enceladus	3.9	1 8.9	26 44.7	0.0001	11.6	W. Herschel	1789, Aug. 28
Tethys	4.9	1 21.3	26 44.7	0.0000	10.5	G. D. Cassini	1684, March
Dione	6.3	2 17.7	26 44.7	0.0020	10.7	G. D. Cassini	1684, March
Rhea	8.7	4 12.4	26 41.9	0.0009	10.0	G. D. Cassini	1672, Dec.
Titan	20.2	15 22.7	26 7.1	0.0289	8.3	C. Huygens	1655, March
Hyperion	24.5	21 6.6	26 0.0	0.1043	13.0	G. P. Bond	1848, Sept. 16
Iapetus	58.9	79 7.9	16 18.1	0.0284	10.1 to 11.9	G. D. Cassini	1671, Oct.
Phoebe	214.2	550 10.6	174°.7	0.1659	14.5	W. H. Pickering	1898, Aug.

perhaps, only about 150 miles.

The five inner satellites seem to form a class by themselves. Their orbits are nearly circular and their planes coincide exactly or very nearly with that of the ring system and the planet's equator. Thus, so far as the position of the planes of rotation and revolution are concerned, the system keeps together as if it were rigid. This results from the mutual attraction of the various bodies. A remarkable feature of this inner system is the near approach to commensurability in the periods of revolution. The period of Tethys is very nearly double that of Mimas and the period of Dione about double that of Enceladus. The result of this near approach to commensurability is a wide libration in the longitudes of the satellites, having periods very long compared with the times of revolution.

Each of the four outer satellites has some special feature of interest. Titan is much the brightest of all and is unique among all the satellites in the solar system in possessing an atmosphere. In 1944 conclusive evidence was found by Gerard P. Kuiper at the McDonald observatory that an atmosphere containing methane and possibly ammonia surrounds the satellite. Hyperion is so small as to be visible only in a powerful telescope, and has a quite eccentric orbit; its time of revolution is almost commensurable with that of Titan, the ratio of the periods being three to four, with the result that the major axis of the orbit of Hyperion has a retrograde motion of $18^{\circ} 40'$ annually, of such a character that the conjunction of the two satellites always occurs near the apocentre of the orbit, when the distance of the orbit from that of Titan is the greatest. This is among the most interesting phenom-

nia, notably some of the epitaphs of the Scipios, (2) fragments of Livius Andronicus's translation of the *Odyssey* and of Naeivius's *Bellum Punicum*, with a very few remnants of other authors. The following are specimens of this verse:

Dabunt malum Metelli/ Naevio poetae
Quamde mare saevom/ vis et quo sunt magnae.

The scansion is very doubtful; on the whole it is more likely that it is accentual¹ than that it is quantitative. Some account of it will be found in Lindsay, *Early Latin Verse*, p. 9.

Nothing resembling the Saturnian exists in English; the example given by Macaulay ("The queen was in the parlour eating bread and honey") is not in the least like it.

SATURNINUS, LUCIUS APPULEIUS, Roman politician. Quaestor in 104 B.C., he superintended the importation of corn at Ostia, but was removed by the Senate, apparently without any charge against him being made and so went over to the popular party. Tribune in 103, he made an arrangement with Marius for the allotment of 100 *ingera* of land to each of Marius' veterans. It was probably at this time also that he introduced his law on *maiestas* (treason), which seems to have been designed to increase the power of the tribunes. In 101 he was tried for violating the law of nations in connection with the embassy of Mithridates. The envoys had arrived with large sums of money to bribe the Senate and Saturninus exposed the affair and insulted the ambassadors. He escaped by appealing to the people. He further

¹On this theory, in its most probable form, the line has 3+2 accents, and usually consists of 7+6 syllables, as "quóius fórrna virtútei parísuma fuit."

cultivated popularity by supporting the claims to citizenship of a freedman, Equitius, who posed as a son of Tiberius Gracchus (*q.v.*). Saturninus allied himself with C. Servilius Glaucia, and the two of them acted as Marius' political agents after his return from the war with the Cimbri. By bribery and murder Marius was elected consul for the sixth time in 100, Glaucia praetor and Saturninus tribune again. Saturninus then brought forward an extension of the African agrarian scheme, which included the distribution of the land north of the Po, taken from the Cimbri, among Marius' veterans, and the foundation of a number of new citizen colonies, to which Italians were to be admitted, a feature which caused a good deal of opposition. A further clause provided that every Senator should swear to observe it within five days of its becoming law. Metellus Numidicus, Saturninus' chief enemy, alone refused, and went into exile. The law was passed eventually after considerable disorder. At last Saturninus and Glaucia found themselves in danger of being disowned by Marius, and their only hope of safety lay in retaining office. In the elections at the end of 100 Saturninus was again elected tribune, and Glaucia stood for the consulship. During the voting their partisans beat C. Memmius, the senatorial candidate, to death. The Senate declared them public enemies, and called on Marius to take up arms against them. Saturninus was defeated in a battle in the forum, and took refuge in the Capitol (Dec. 10). Forced to surrender, he and Glaucia and their followers were imprisoned in the *Curia Hostilia*, and some of the opposite party tore off the roof and stoned them to death.

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SATYRS, in Greek mythology, spirits half-man, half-beast. They are not mentioned in Homer; in a fragment of Hesiod they are called brothers of the mountain nymphs and Curetes, an idle and worthless race. They were a roguish but faint-hearted folk, lovers of music, wine and women, dancing with the nymphs or pursuing them, and striking terror into men. They had a special form of dance called *Sikinnis*. In early Attic art they were represented as grotesque men with horses' tails; later they approached the type of Pan (*q.v.*). A statue, supposed to be a copy of a work of Praxiteles, represents a graceful satyr leaning against a tree with a flute in his hand. In Attica there was a species of drama known as the satyric; it treated its themes in a half-comic manner and the chorus was composed of satyrs. Sophocles' *Ichnerautai* and Euripides' *Cyclops* are the only extant examples. In Italy, the satyrs are often identified with the fauni (see *FAUNUS*).

In the Authorized Version of Isa. xiii. 21; xxxiv. 14 the word "satyr" is used to render the Hebrew *sə'irim*, "hairy ones." A kind of demon or supernatural being known to Hebrew folk-lore as inhabiting waste places is meant; a practice of sacrificing to the *sə'irim* is alluded to in Lev. xvii. 7, where the English version has "devils." They correspond to the "shaggy demon of the mountain-pass" (*azabb al-akaba*) of old Arab superstition.

See also *SILENUS*. For similar modern Greek beliefs, see Lawson, *Modern Greek Folk-lore*, p. 190.

SAUCE, a flavouring or seasoning for food, usually in a liquid or semi-liquid state, either served separately or mixed with the dish. The preparation of suitable sauces is one of the essentials of good cookery. The word comes through the Fr. from the Lat. *salsa*, salted or pickled food (*salire*, to season or sprinkle with *sal*, salt). The colloquial use of "saucy," impudent, "cheeky" is an obvious transference from the tartness or pungency of a sauce.

Hot Sauces.—These may be divided into *White* and *Brown*, and from them many hundreds of sauces are made. Variations from a plain white sauce are egg sauce, onion sauce, anchovy sauce, parsley sauce, caper sauce, oyster sauce, celery sauce, etc. A blending of fat and flour, known in the culinary world as a *roux*, is the foundation of nearly every sauce. The fats used may

be butter, oils, clarified fat, a blend of lard and butter, or margarine, or dripping. The fat is first melted and sufficient flour is stirred into it to absorb it; equal quantities of fat and flour are usual. Liquids for white sauces may be water, milk and water, milk, white stock, milk and stock. Cream may be added if liked, also beaten eggs and any flavouring such as sherry, vanilla, vinegar, lemon juice. Brown stock, water, or stock and water, are the liquids used for brown and fawn sauces. Lumpy sauces are caused by insufficient stirring which causes unequal bursting and thickening of the starch grains in the flour. Sauces must boil for 8 to 10 minutes. Espagnole, Béchamel and Velouté are white sauces used as a foundation in many variations.

Cold Sauces.—(1) *The Mayonnaise Class*. A simple mayonnaise is made from raw yolk of egg, salad oil, tarragon and white wine vinegars, mustard, pepper and salt. One yolk of egg will blend with as much as $\frac{1}{2}$ pt. oil if the oil is stirred in very gradually, drop by drop, to the yolk: the vinegar can be added from time to time as the mixture gets thick and the quantity can be left to the taste of the cook. A good mayonnaise should not taste too acid or too oily. Additions of chopped capers or gherkins to this make Tartare sauce.

(2) *Chaudfroid Sauces*, for coating meat, poultry, fish. These may be brown, fawn, white, red, green, the foundations being a good brown or white sauce, tomato sauce, cucumber sauce. To these sauces are added aspic jelly, gelatine and a little cream.

Miscellaneous Sauces.—(a) those made from purées, some of which are thickened with cornflour, i.e. tomato, cucumber, spinach, apple, celery, (b) custard sauces made from eggs and milk and flavoured with vanilla, lemon or wine, i.e., sherry sauce, (c) those made from syrups, i.e., jam, lemon, marmalade, (d) mint, horseradish. (E. G. C.)

SAUGERTIES, a village of Ulster county, N.Y., U.S., on the west bank of the Hudson river, at the mouth of the Esopus, 100 mi. N. of New York city, near the base of the Catskill mountains. It is on federal highway 9W and is served by the New York Central railroad. Pop. (1950) 3,927; (1940) 3,916, by federal census. It is in the midst of picturesque scenery, and there are many summer homes along the Hudson and elsewhere in the vicinity. The village of Woodstock (incorporated 1787) with its colony of artists and summer art school is 10 mi. W. and 4 mi. S. of Woodstock is the Ashokan reservoir. Saugerties has several paper and paper-products mills, limestone and bluestone quarries, brickyards and other industries. The village was settled about 1710 by Germans, and several houses date from the 18th century.

It was incorporated in 1831.

SAUGOR or **SAGAR**, so named after its beautiful lake, a town and district of British India in the Jubbulpur division of the Central Provinces and Berar. The town, in a picturesque situation on a spur of the Vindhyan hills about 1,700 feet above sea level, has a station of the Indian Midland section of the G.I.P. railway. Population (1941) 50,733.

It is the seventh largest town in the province. The town is handsomely built and the cantonment well wooded. It has no factories and its old industries, which included the manufacture of gold and silver ornaments, are not very flourishing.

There is an old Mahratta fort, now used as a police-school, which was held for several months by the Europeans in the Mutiny until relieved by Sir Hugh Rose.

The district of Saugor has an area of 6,761 square miles. It is an extensive, and in parts fairly level, plain, broken in places by low stony hills of Vindhyan sandstone. It is traversed by numerous streams, of which the Sunar, Beas, Dhasan and Bina are the principal, flowing in a central direction and being affluents of the Ganges. In the southern and central parts the soil is black, formed by decaying trap. In the north and east it is reddish-brown alluvium. The population in 1941 was 939,068.

The district contains five small towns and 1,830 villages. The chief land-holding classes are Brahmins, Dangis, Lodhis and Bundela Rajputs. Mohammedans are only 5% of the population. Government forests cover 750 sq.mi. but are not of great value. There is good iron ore in the Shahgarh tract smelted in small

furnaces and some fine sandstone quarries.

SAUGUS, a town of Essex county, Massachusetts, U.S.A., adjoining Lynn on the west. It is served by the Boston and Maine railroad. The population in 1950 was 17,146; (1940) 14,825; (1920) 10,874, federal census. Saugus is primarily a residential town, but in early times it was important industrially. It was one of the first New England towns to engage in the manufacture of shoes and woollen goods, and was the site of the first iron works, where the die for the Pine Tree shilling was cast. Settlement dates from 1620. The town was incorporated in 1815.

SAUJBULAQ (sowj-booh-lahk'), chief town of that part of the Iranian province of Azerbaijan south of Lake Urmia. Ethnographically, the district forms part of Iranian Kurdistan. The town stands in a remarkably fertile valley, in $36^{\circ} 45' N.$, and $45^{\circ} 47' E.$, at an elevation of 4,272 ft. The population, est. 9,000, is composed chiefly of settled Kurds of the Mukri tribe, of which Saujbulaq may be regarded as the local capital. The town is connected with Tabriz by road. Saujbulaq is famous for a superior type of Kurdish rug.

There are many more localities named Saujbulaq (Turkish, meaning "cold spring") in Iran, the most notable, after the above-mentioned Kurdish city, being a district of the province of Tehran, with many villages.

SAUK and **FOX**. These two closely related Algonkin tribes were encountered west of Lake Michigan by the French in the second half of the 17th century. The Sauk (or Sac) had been driven there from Michigan by Iroquoian and Algonkin foes not long before; the Fox, probably somewhat earlier. The friendship of the French for these foes rendered the Fox, and finally the Sauk, enemies of the French. They were the only Algonkin so to align themselves; and in the end withdrew from Wisconsin to Iowa, where they found shelter in territory of the Siouan tribe of that name. This change removed them from the timber to the prairies, and their culture began to be characteristic of the open spaces. They remained restless and aggressive, and in 1832, with the Kickapoo, engaged in the Black Hawk war. The two tribes probably never numbered much more than 3,000 each, and were often considerably reduced by warfare. A total of 1,000 remain on reservations in Iowa, Kansas and Oklahoma.

SAUL, son of Kish, a Benjaminite, was the first king of Israel. He began to reign c. 1025 B.C. The traditions as to his history are closely interwoven with those concerning Samuel and David. Various views may be taken of these records, among the most dramatic in sacred literature but, by scholars, it is generally recognized that the stories of 1 Samuel preserve two different traditions about the rise of the monarchy in Israel. In each there is an account of Saul's election; each relates that he was anointed by Samuel and records his rejection. It is probable that two distinct continuous histories have been combined in the existing text of Samuel. According to the later of the two traditions the elders of Israel, seeing that the sons of Samuel, who are destined to succeed him, are corrupt, demand that he shall make them a king "to judge them like all the nations." Samuel is displeased, but Yahweh reluctantly—for such a request was a grave affront to the deity, the true king of Israel—bids him concede the demand. The seer points out to the people that a king will oppress them, but fails to dissuade them (1 Samuel viii.). He summons a solemn assembly at Mizpah, and, once more reminding them of their folly, chooses Saul, by lot under Yahweh's direction (x. 17-24). In an elaborate sermon (xii.), he succeeds in convincing the people that their action has been sinful. And hardly has Saul seated himself upon the throne when Yahweh rejects him, and bids Samuel anoint David to succeed him in due time (xvi. 1-13). See SAMUEL.

The earlier tradition, which is distinctly more primitive in its religious ideas, contributes other sidelights on the matter. Samuel, to whom Saul comes seeking the seer's help in the finding of some lost asses, is previously warned by Yahweh that the suppliant is the divinely chosen saviour who is to deliver Israel from Philistine oppression. With whole-hearted enthusiasm Samuel anoints Saul to be "prince over Yahweh's inheritance" (ix.-x. 1). Saul and his son Jonathan achieve notable victories over the Philistines (xiii.). According to this tradition Saul is a God-given saviour, like the heroes in Judges, who rescues his people from the grievous domination of the Philistines. An appropriate introduction to this narrative is missing from *1 Samuel*, but the introduction to the story of Jephthah (*Judges x.*

6-16)—to which what follows is certainly not the obvious sequel—would very well fit it. The suggestion has therefore been made that possibly according to an old tradition Saul was the immediate successor of Jephthah (*cf. Cambridge Ancient History*, vol. ii, p. 371 seq.).

Though the reign of Saul was marked by considerable successes he was hampered by friction within as well as by foes without. Comparatively early his relations with Samuel seem to have become strained, and his declining years were embittered by the growing importance of his rival, David. Finally he fell a victim to his ancient enemies, the Philistines, who inflicted a heavy defeat on Israel in the battle of Mount Gilboa, where his sons were slain, and he himself perished. Here, again, we have two distinct accounts. According to one, being "greatly distressed by reason of the archers," he implored his armour-bearer to kill him, that he might not be slain by uncircumcised Philistines, and when his armour-bearer refused fell upon his own sword (*1 Samuel xxxi. 1-7*). The other story (*2 Samuel i. 1-10*), represents him as making a similar request to an Amalekite camp-follower, who, unlike the armour-bearer, complies. It is possible that this is a fiction on the part of the Amalekite, though the context hardly suggests such a view.

According to one estimate of the documents, the character of Saul was deprecated by Judaean historians anxious to exalt David and by anti-monarchs whose ideal was Samuel. Others have found in the narrative an ethical significance of perpetual value. However, Saul played a considerable part in the freeing of Israel from the Philistine yoke. Though his reign ended in the gloom of tragedy he achieved notable successes on the battlefield, and was a greater king than the existing narratives would lead us to suppose. This is borne out by the ascription to him of important victories (*cf.* 1 Samuel xiv. 42-51) and even more by the ancient lament from the "book of Jashar" (2 Samuel i. 19-27), which paints the fallen king as "mighty," a warrior whose "sword returned not empty," "swifter than an eagle," "stronger than a lion," who brought good spoil to his people, and whose death was to the Philistines a source of exultation. That he maintained his position despite the popularity of David, and that his kingdom endured for a time after his death even with a weakling like his son Ishbosheth as its nominal head, point in the same direction. In short, we may discern in the Scriptural narratives the figure of a brave, impulsive, superstitious man, whose contribution towards the building up of the kingdom has been underestimated.

(W. L. W.)

SAULT SAINTE MARIE, a city of Michigan, U.S., at the east end of the upper peninsula, on St. Marys river, the outlet from Lake Superior into Lake Huron; a port of entry and the county seat of Chippewa county. It is the northern terminus of federal highway 2 and is served by the Canadian Pacific, the Duluth, South Shore and Atlantic and the Soo Line railways, and lake steamers. A railway bridge and ferries connect it with the Canadian town of the same name in Ontario on the north side of the river. The population was 17,750 in 1950 and 15,847 in 1940 (federal census). The river there drops ("leaps") 20 ft. in less than a mile, which explains its name "Rapids of Saint Mary." The two canals, with their five great locks (four on the U.S. side, one on the Canadian), form the greatest ship highway in the world. An average of 100 ships a day pass through during the navigation season of eight months, and the total traffic in 1948 amounted to 113,523,588 tons. The Davis and the Sabin locks (1,350 ft. long and 80 ft. wide) are the longest in the world; they were built between 1907 and 1919. The MacArthur lock (800 ft. long and 80 ft. wide) was opened in 1943. The Poe lock (704 ft. long and 100 ft. wide) was opened in 1896. The Canadian lock, opened in 1895, is 900 ft. long. The city has large lake traffic, chiefly in coal and limestone and has various industries. In 1917 it adopted a commission-manager form of government.

Sault Sainte Marie is the oldest settlement in Michigan. It was visited in succession by Étienne Brûlé (sometime between 1611 and 1623), Jean Nicollet (1634), St. Isaac Jogues and Rambault (1641), Pierre Esprit, sieur de Radisson, and Médard Chouart, sieur de Groseilliers (1658); and in 1668 by Father Marquette. In 1671 the governor-general of New France called a great council of the Indians at that spot, and in the name of the king of France took formal possession of all the country south to the Gulf of Mexico and west to the Pacific. The British flag flew over the American Sault from 1762 until June 15, 1820, when Gov. Lewis Cass raised the Stars and Stripes. The first Fort Brady was built in 1822 and was occupied until 1893, when the post was rebuilt on its present site. The village was incorporated in 1879 and was chartered as a city in 1887. St. Mary's river was navigated by the canoes and bateaux of the Indians and early

voyageurs, who made a portage around the falls. The North West Fur company built a lock on the Canadian side of the river in 1797–98. The state lock and canal were opened in 1855.

SAUMAREZ, JAMES SAUMAREZ [or SAUSMAREZ], BARON DE (1757–1836), English admiral, was born at St. Peter Port, Guernsey, on March 11, 1757. He entered the navy as midshipman at the age of 13. For his bravery at the attack of Charleston in 1776, on board the "Bristol" he was raised to the rank of lieutenant, and he was promoted commander for his gallant services off the Dogger Bank, Aug. 5, 1781, when he was wounded. In command of the "Russell" (70), he contributed to Rodney's victory over De Grasse (April 12, 1782). For the capture of "La Réunion," a French frigate, in 1793, he was knighted. He took part in the defeat of the French fleet off Lorient (June 22), distinguished himself in the battle of Cape St. Vincent in Feb. 1797, and was present at the blockade of Cadiz (Feb. 1797–April 1798), and at the battle of the Nile, where he was wounded. On his return from Egypt he received the command of the "Caesar" (84), with orders to watch the French fleet off Brest during the winters of 1799 and 1800. Between July 6 and 12, 1801, he routed a superior combined force of French and Spanish ships at Algeciras. On the outbreak of the war with Russia in 1809 he was given command of the Baltic fleet. He held it during the wars preceding the fall of Napoleon, and his tact was conspicuously shown towards the government of Sweden at the crisis of the invasion of Russia. At the peace of 1814 he attained the rank of admiral; Charles XIII (Bernadotte) bestowed on him the grand cross of the military Order of the Sword. He was raised to the peerage in 1831, and died at Guernsey on Oct. 9, 1836.

See *Memoirs of Admiral Lord de Saumarez*, by Sir John Ross (2 vols., 1838).

SAUMUR, a town of western France, capital of an arrondissement in the department of Maine-et-Loire, 28 mi. S.E. of Angers on the railway to Tours. Pop. (1946) 17,635. The Saumur caves along the Loire and on both sides of the valley of the Thouet must have been occupied at a very remote period. The Tour du Tronc (9th century), the old stronghold of Saumur, served as a place of refuge for the inhabitants of the surrounding district during foreign invasions (whence perhaps the name Saumur, from *Salons Murus*) and became the nucleus of a monastery built by monks from St. Florent Le Vieil. On the same site rose the castle of Saumur 200 years later. The town fell into the hands of Foulques Nerra, duke of Anjou, in 1025, and passed in the 13th century into the possession of the kings of France. After the Reformation the town became the metropolis of Protestantism in France and the seat of a theological seminary which, as opposed to that of Sedan, represented the more liberal side of French Protestantism (Catheron, Amyraut, etc.).

In 1623 the fortifications were dismantled; and the revocation of the edict of Nantes reduced the population by more than one half. In June 1793, the town was occupied by the Vendéens, against whom it soon afterwards became a base of operations for the republican army.

Saumur stands on the left bank of the Loire, which here receives the Thouet, and on an island in the river. A large metal bridge connects the Tours-Angers railway with that of Montreuil-Bellay, by which Saumur communicates with Poitiers and Niort. Two stone bridges (764 and 905 ft. long) unite the town on the island with the two banks of the river. The church of St. Pierre, of the 12th century, has a 17th-century façade and a Renaissance nave; and Notre-Dame of Nantilly has a remarkable façade, a doorway and choir of the 12th century, and a nave of the 11th. St. Jean is a 12th-century building in the purest Gothic style of Anjou. St. Nicolas-du-Chardonnet, 12th century Gothic, has a fine modern spire. The *hôtel de ville* is a 16th century building and the town has many houses of the 15th, 16th and 17th centuries, notably that known as the Maison de la Reine Cécile (15th century), built by René, duke of Anjou. The castle was built between the 11th century and the 13th, and remodelled in the 16th. There is also an interesting almshouse, with its chambers in part dug out in the rock. The famous cavalry school of Saumur was founded in 1768 and was used for the special training of young

officers appointed to cavalry regiments on leaving the cadet school of St. Cyr. Saumur is the seat of a subprefect, and of a tribunal of commerce, a chamber of commerce and a horticultural garden with a school of vines. Saumur prepares and carries on a large trade in the sparkling white wines made in the neighbourhood, as well as in brandy, and it manufactures enamels and rosaries.

SAURASHTRA: see KATHIAWAR.

SAUSAGE is one of the older forms of processed food. Where or when it was originated is not known; it appears in ancient literature as a recognized food item. The first authenticated reference appears in the *Odyssey* written by Homer, 9th century, B.C., who wrote: "As when a man near a great, glowing fire turns to and fro a sausage, full of fat and blood, anxious to have it quickly roast; so to and fro Odysseus tossed, and pondered how to lay hands upon the shameless suitors. . . ."^{*}

Later Grecian literature makes frequent mention of sausage, employing the term, *oryae*, meaning sausage, or referring to specific types, such as salami. Athenaeus, in the *Deipnosophists*, A.D., 228, the oldest cookery book that has come down to us, says: "Epicharmus mentions sausages, calling them *oryae*, a name by which he even entitles one of his plays, *The Orya*; this was about 500 B.C." Again: "Aristophanes says in the *Clouds* (423 B.C.): 'Let them make sausages of me and serve me up to the students.'" Salami, according to the *Deipnosophists*, is mentioned by Eubulus in *The Laconians* and by Mnesimachus in his play, *The Horse Breeder*. Since the time of Christ, sausage has been mentioned frequently in the literature of virtually all peoples.

The word, sausage, as used today is derived from the Latin, *salsus*, meaning salted, or literally, preserved meat. While this term was used by the Romans to denote meat preserved through the use of salt, various kinds of sausage were generally popular with Romans and Greeks of all classes at the time of the Caesars. The ancient Romans were extremely fond of a sausage made of fresh pork and white pine nuts chopped fine with cumin seed, bay leaves, and black pepper. So popular was this sausage that it became ritually identified with the annual orgiastic Lupercalian and Floralian festivals and was condemned by the early Christian church because of its association with these public debauches. As a result, Constantine the Great, when he became emperor of Rome and embraced Christianity, prohibited sausage eating. This prohibition remained in effect throughout the reigns of several Christian emperors but finally was repealed because of popular protest and because of bootlegging.

Sausage making became a culinary art in the Middle Ages and certain of the sausages popular today derived their names from the European cities in which they were originated. Among such sausages are frankfurters (Frankfort, Germany); bologna (Bologna, Italy); romano (Rome, Italy); genoa salami (Genoa, Italy); berliner (Berlin, Germany); gothaer (Gotha, Germany); goteborg (Gothenburg, Sweden); lyons (Lyons, France); arles (Arles, France). While no documentary evidence exists as proof, it has been deduced that salami may have been named for the ancient Grecian city, Salamis, located on the east coast of Cyprus in the Aegean Gulf and destroyed about 449 B.C. Basically, all sausage is comminuted meat and products differ primarily because they are spiced in varied ways and because they are produced by varied methods of processing. There are six classifications of sausage and ready-to-serve products, as follows:

Fresh sausage is made of meats that have not been cured. The product is merchandised uncooked. Examples: fresh pork sausage, bratwurst, fresh thuringer.

Smoked sausages are made from cured meats and subjected to the heat and flavouring effect of wood smoke. There are two classes of smoked products: **uncooked** smoked sausage—including smoked pork sausage and mettwurst; and **cooked** smoked sausage—including frankfurters, bologna, berliner, and German mortadella.

Cooked sausages (not to be confused with **cooked** smoked sausage) are made from uncured meats, although cured meats sometimes are included. These products are cooked and, although smoking is not precluded, such smoking is done after cooking. Included are liver sausage, blood sausage, and tongue and blood sausage.

Cooked specialties generally are made from uncured meats and include products not specifically regarded as sausage but closely allied. They include headcheese, souce, and meat loaves.

New conditioned sausage is made of ground fresh meat to which curing ingredients and spices are added, following which the meat is allowed to cure in pans for 48 hours. The meats then are encased and the sausage cooked in a smokehouse at high temperatures, followed by a period of air drying. Examples: cooked salami, thuringer cervelat, and Kosher salami.

Dry sausage is made from fresh, comminuted meats to which curing ingredients and spices have been added, followed by a curing period of two to three days. The meat then is encased and the product processed by carefully controlled air drying for a considerable period of time. These products include farmer, holsteiner, goettinger, goteborg, landjaeger, and gothaer cervelats; Italian salamis, German and Hungarian salamis, arles, lyons, pepperoni, frizzes, and chorizos. It

*Book 20—page 310, *The Odyssey of Homer*, translated by George Herbert Palmer, published by the Riverside Press, Cambridge, Mass. Copyright 1884, 1912, 1921.

SAUSSURE

is estimated that nearly two hundred different varieties of sausage and ready-to-serve meat products are marketed. The greater percentage of these are encased sausages, the exceptions being bulk pork sausage and some of the cooked specialties, such as meat loaves. Sausage casings are of two types—natural and artificial. Natural casings consist of properly cleansed and processed intestines of hogs, sheep, or cattle. Artificial casings are derived from cellulose which is made into tubular form of appropriate size. Sausage sometimes, also, is stuffed in cloth bags, which are paraffined to prevent the escape of moisture. A great variety of spices are employed in sausage making, varying combinations of these being employed to produce appetizing taste effects. These spices, procured from all parts of the world, include allspice, anise, caraway, cardamom, cassia, celery, cinnamon, cloves, coriander, cumin, dill, fennel, bay leaves, mace, marjoram, mustard, nutmeg, parsley seed, pepper, sage, and thyme. Reports by the United States Department of Commerce disclosed that sausage production in the United States in 1937 totaled more than 1,467,000,000 pounds, with a plant value of \$262,967,000. Frankfurters represent the most popular American sausage product, representing about 32% of total production, with bologna second with about 25% of total production. Pork sausage is third with about 12%. Dry sausage is fourth with about 9%.

About 63% of the sausage manufactured in the United States is produced under inspection of the Bureau of Animal Industry of the United States Department of Agriculture, in accordance with rigidly enforced standards as to sanitation and wholesomeness. The remaining 37% of sausage is manufactured for intrastate consumption in accordance with similar standards imposed by State or local regulations.

In most European countries sausage is produced primarily by local butchers or meat merchants, in contrast to production in the United States where the major share of production is handled by the meat packing and sausage manufacturing industry. As a result, similar sausages are known by varying names in different localities and differ according to local preference. Thus, products which are popular in one community may be virtually unknown in another section of the country, or may be known under a different name. Frequently, too, seasonings in similar types of product will vary widely according to the locality in which it is produced. Some seasoning differences occur in American products according to the locality but these differences are much more limited than in European countries.

Thus, *boudins* or *boudins-noir*—or black puddings, as they are called in Great Britain—are made in some parts of Scotland from hog's blood, shredded suet, dried oatmeal, and minced onions, with plenty of pepper and salt; as Houdibras says:

"Fat black puddings—proper food
For warriors who delight in blood,"

but the seasoning varies in different localities. In England, for example, caraway and coriander are used in Cheshire, but the Shropshire variety has none of the former and very little of the latter; in Staffordshire the seasoning consists of equal quantities of salt, pepper, marjoram, pimento, with twice as much thyme; in Yorkshire twice as much marjoram and thyme as pepper and salt, also a little savoury and lemon thyme may be used; while the Stretford variety is highly seasoned with equal proportions of salt, pepper, marjoram, mint, and thyme. In France, beetroot leaves and garlic are sometimes used; in Spain, fennel may be added; in Germany thyme and marjoram.

This product apparently is very similar to that mentioned in Homer's *Odyssey*, previously quoted, and to the American blood sausage, in which hog blood, pork meat and gelatinous meats and sometimes ham fat are combined with salt, pepper, allspice, cloves, and onions. Sometimes, also, cooked and cured pork or lamb tongues are added to the formula and the product called blood and tongue sausage. In some parts of France it is the custom to eat black puddings on Christmas Eve after returning from midnight mass. They are always boiled directly after they are made and are then kept in a cool place; when served they may be either boiled up again or grilled. In Flanders they are accompanied by a dish of baked apples.

In addition to Scottish black puddings there are Scottish white puddings made of good beef-suet minced and mixed with a third of its weight in highly toasted oatmeal, seasoned with salt and pepper, stuffed into skins and boiled. Liver puddings are made in the same way with the addition of one-fourth the quantity of parboiled liver grated, and some shredded onions.

The French *boudins blancs* are most superior. They are made of the white parts of raw chicken finely minced, yolk of eggs, onions, breadcrumbs, salt and spices mixed with cream or milk, stuffed into skins and boiled in milk and water; when served they are grilled. Other French *boudins* are made of game, fish, etc.

Frankfurters, wieners, and vienna-style sausages in the United States are almost identical in formula, consisting of about 60% cured beef and 40% cured pork, spiced with white pepper, sugar, cloves, coriander, and nutmeg. This formula is stuffed into sheep casings or hog casings and formed into 4- to 5½-inch links; subjected to hardwood smoke and then cooked in steam or water. Frankfurters and vienna sausages also are made in various European countries with varying spice content.

Bologna in the United States is made with a similar meat content,

spiced with black pepper, cloves, coriander, and ginger. Large beef casings, or cellulose casings of similar size, are used and the sausage is smoked and cooked. Similar products are made in various European countries. Polony is a corruption of bologna which it resembles. Sheffield is more celebrated for polony than any other town in England. Italy and Germany vie with each other in the varieties of sausage produced. Various types of salami are made in Italy, Hungary, and Germany. Salamis consist mainly of cured lean pork, coarsely chopped, and some cured lean beef, finely chopped. These meats are moistened with red wine, flavoured with garlic and various spices, stuffed into large casings and air-dried. German and Hungarian salamis are less highly flavoured and more heavily smoked than Italian salamis and contain garlic. Varying types of salami are manufactured in the United States, frequently to meet the demands of the various nationalities in certain trade areas.

The cervelats generally are less highly seasoned than salami and generally consist of about equal parts of cured pork and beef, encased and air-dried. In farmer cervelat, the meat is chopped rather coarsely and packed in straight casings about 1½ inches in diameter. Holsteiner is similar to farmer, except that it is packed in ring-shaped style. Goteborg is a cervelat of Swedish origin, coarsely chopped, somewhat salty and heavily smoked. Landjaeger is cervelat of Swiss origin filled into casings about the size of a large frankfurter, pressed flat and smoked. Gothaer generally is made only of very lean pork, finely chopped and cured. All cervelats are air-dried.

Capicolla, an Italian dry sausage, is made of boneless pork shoulder butt, seasoned with ground red-hot or sweet peppers, salt and sugar, mildly cured and air-dried. Italian mortadella is composed of very finely chopped cured pork and beef, with added cubes of back fat. It is delicately spiced and placed in very large casings, smoked at a high temperature and then air-dried. Pepperoni, and other Italian dry sausages, is made of cured pork trimmings and sometimes beef, with added cubed fat. Ground red pepper is used in addition to the usual dry sausage seasonings. Spanish and Mexican chorizos are made of cured pork and beef, stuffed and linked in casings the size of a large frankfurter and air-dried. It is highly seasoned. Longaniza is similar to chorizo, although sometimes made exclusively of beef. It is never linked but like the American country-style pork sausage, is sold in lengths, according to demand.

Typical Swedish sausages include *sylta*, somewhat similar to the American headcheese and the Mexican *queso de puerco*; potato sausage; rolled *sylta*, which is a thin slab of bacon, spiced, rolled and pickled; *gyrnkorv*, made from cooked barley and pork fat; and *falukorv*, which is somewhat similar to American bologna.

Polish sausages include Krakau, a highly seasoned, smoked pork sausage; and barley sausage, made from buckwheat grits, liver and highly spiced. Liverwurst, or liver sausage or liver puddings are made in virtually all countries. In the United States they are made from finely ground selected fat pork, liver and gelatinous material, seasoned with onions and spices, encased and cooked. Smoked liver sausage is liver sausage that has been smoked after cooking. English liver sausage is manufactured similarly, but may contain oatmeal or rusks.

SAUSSURE, HORACE BENEDICT DE (1740–1799), Swiss physicist and Alpine traveller, was born at Geneva on Feb. 17, 1740. From 1762 to 1786 he was professor of philosophy at the academy of Geneva. He became F.R.S. in 1768, and in 1772 founded the *Société pour l'Avancement des Arts* at Geneva. His health began to fail in 1791, but he was able to complete his great work in 1796. He died on Jan. 22, 1799. His early devotion to botanical studies led him to undertake numerous journeys among the Alps, and from 1773 onward he devoted much of his attention to the geology and physics of that great chain. In addition, he experimented in his small laboratory and applied chemistry and physics to his studies of the geology of the district. One of de Saussure's greatest contributions was in the field of meteorology in which he carefully investigated atmospheric humidity and its measurement. He developed the hair hygrometer, an instrument for measuring humidity still used essentially in its original form. The results of this work were published in *Essais sur l'Hygrométrie* (1783). Among his most famous ascents were Mont Blanc (1787), Col du Géant (1788), Crammont (1784–1788), Klein Matterhorn (1792). The descriptions of seven of his Alpine journeys were published as *Voyages dans les Alpes* (4 quarto vols. 1779–96 and 8 octavo vols. 1780–96). The non-scientific portions of the work were first published in 1834, and have often been republished, under the title of *Partie pittoresque des ouvrages de M. de Saussure*.

See Lives by J. Senebier (Geneva, 1801), by Cuvier in the *Biographie universelle*, and by Candolle in *Décade philosophique*, No. xv. (trans. in the *Philosophical Magazine*, iv. p. 96); articles by E. Naville in the *Bibliothèque universelle* (March, April, May 1883), and chaps. v.–viii. of Ch. Durier's *Le Mont-Blanc* (various editions between 1877 and 1897).

SAUTERNES—SAVANNAH

SAUTERNES are golden white table wines, full-bodied and usually possessing some sweetness. They take their name from the Sauternes district near Bordeaux, in France. There the grapes are left on the vines until they have passed the stage of full ripeness; a wine mould called the *Botrytis cinerea* settles upon them, forming a feltlike mycelium or "mat" on the skins through which much of the water in the grapes evaporates. The result is a relatively high content of natural grape sugar.

The juice of the semidried grapes, after crushing, is fermented without the skins. Fermentation completes itself without having exhausted all of the grape sugar; if a sweeter wine is desired, fermentation is halted by addition of sulphur dioxide.

Sauternes produced elsewhere follow adaptations of these methods. Sometimes a wine maker using grapes lower in sugar will permit fermentation to run its course and later add to the wine, cleared of yeasts, some unfermented juice of the same grapes which has been kept apart in its sweet state.

Sauternes differ widely in sweetness. In the United States they range from "dry," with not more than 1.5% of grape sugar by weight, to "sweet," with as high as 6%. Even sweeter Sauternes are known. The terms "haut" and "château" are sometimes used interchangeably for "sweet"; but in France "haut" indicates better-than-average quality and "château" the fact that the wine was bottled on the estate where it was grown.

Traditionally Sauternes are produced by blending three grape varieties, Semillon, Sauvignon blanc and Muscadelle du Bordelais. This tradition is followed wherever these grapes can be successfully grown, as in some parts of California; elsewhere other grapes are used. (See WINE.)

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SAVAGE, RICHARD (d. 1743), English poet, was born about 1697, probably of humble parentage. A romantic account of his origin and early life, for which he supplied the material, appeared in Curril's *Poetical Register* in 1719. On this and other information provided by Savage, Samuel Johnson founded his *Life of Savage*, one of the most elaborate of the *Lives*. It was printed anonymously in 1744, and made the poet the object of an interest which would be hardly justified by his writings. In 1698 Charles Gerrard, 2nd earl of Macclesfield, obtained a divorce from his wife, Anna, daughter of Sir Richard Mason, who shortly afterward married Col. Henry Brett. Lady Macclesfield had two children by Richard Savage, 4th earl Rivers, the second of whom was born at Fox Court, Holborn, on Jan. 16, 1697, and christened two days later at St. Andrews, Holborn, as Richard Smith. Six months later the child was placed with Anne Portlock in Covent Garden; nothing more is positively known of him. In 1718 Savage claimed to be this child. His statements were suspicious, and Mrs. Brett maintained that he was an impostor. The matter was thoroughly investigated for the first time by W. Moy Thomas, who published the results of his researches in *Notes and Queries* (second series, vol. vi., 1858). Savage, impostor or not, blackmailed Mrs. Brett and her family with some success, for after the publication of *The Bastard* (1728) her nephew, John Brownlow, Viscount Tyrconnel, purchased his silence by taking him into his house and allowing him a pension of £200 a year. Savage wrote two successful plays: *Love in a Veil* (1718), adapted from the Spanish, and *Sir Thomas Overbury* (1724). *Miscellaneous Poems* was published by subscription in 1726. In 1727 he was arrested for the murder of James Sinclair, and only escaped the death penalty by the intercession of Frances, countess of Hertford (d. 1754).

Savage was at his best as a satirist, and in *The Author to be Let* he published a quantity of scandal about his fellow-scribblers. Proud as he was, he was servile enough to supply Pope with petty gossip about the authors attacked in the *Dunciad*. His most considerable poem, *The Wanderer* (1729), shows the in-

fluence of Thomson's *Seasons*, part of which had already appeared. Savage tried without success to obtain patronage from Walpole, and hoped in vain to be made poet-laureate. In 1732 Queen Caroline settled on him a pension of £50 a year. Meanwhile he had quarrelled with Lord Tyrconnel, and at the queen's death was reduced to absolute poverty. Pope had been the most faithful of his friends, and had made him a small regular allowance. With others he now raised money to send him out of reach of his creditors. Savage went to Swansea, but he resented bitterly the conditions imposed by his patrons, and removed to Bristol, where he was imprisoned for debt. All his friends had ceased to help him except Pope, and in 1743 he, too, wrote to break off the connection. Savage died in prison Aug. 1, 1743.

See Johnson's *Life of Savage*, and *Notes and Queries* as already quoted. He is the subject of a novel, *Richard Savage* (1842), by Charles Whitehead, illustrated by John Leech. *Richard Savage*, a play in four acts by J. M. Barrie and H. B. Marriott-Watson, was presented at an afternoon performance at the Criterion theatre, London, in 1891. The dramatists took considerable liberties with the facts of Savage's career. See also S. V. Makower, *Richard Savage, a Mystery in Biography* (1909).

SAVAGE ISLAND (NIUE): see PACIFIC ISLANDS.

SAVANNA or **SAVANNAH**, originally a meadow land or large, grassy, treeless tract, but now also including level areas with tall grasses and isolated clumps of trees, as in Nigeria, where the more appropriate name would be *park savanna*. It has also been commonly applied to the grassy plains south of the centre of North America, and is here the equivalent of prairie (*q.v.*).

SAVANNAH, a city of southeastern Georgia, U.S., on the Savannah river, 18 mi. from the Atlantic ocean; a port of entry and the county seat of Chatham county. It is on federal highways 17 and 80 and is served by the Atlantic Coast Line, the Central of Georgia, the Savannah and Atlanta, the Seaboard Air Line and the Southern railways, and by steamship lines operating to both U.S. coasts and to foreign ports. Pop. (1950) 119,689; (1940) 95,996.

The city occupies 15.3 sq.mi. on a plateau 42 ft. above the river. It has extended the original ground plan (designed by Robert Castell and carried out by James Oglethorpe) of broad, straight streets, interspersed at regular intervals with grassy squares and parks, which cover 898 ac. Many dwellings of colonial architecture and buildings of historic interest still remain; there are numerous statues and monuments to local and national heroes. A granite seat marks the spot where Oglethorpe first pitched his tent. Gen. Nathanael Greene is buried under a monument erected to his memory in 1829. Christ Church, now occupying its third building (erected 1838), was organized by George Whitefield in 1740, and its third rector was John Wesley, who established there the first Protestant Sunday school in America. The First African Baptist Church dates its history from 1788. Ten miles south of Savannah is Bethesda, the oldest orphan asylum in the United States, founded by George Whitefield in 1740. The Hermitage, 5 mi. N., is a 500-ac. plantation on the river, settled in 1783, with many of the slave huts and other ante-bellum buildings still standing. Wormsloe, at the south end of Isle of Hope, is occupied by lineal descendants of Capt. Noble Jones, to whom it was originally granted by George II. At Mulberry Grove, the estate given by congress to General Greene, Eli Whitney invented the cotton gin while he was a guest there in 1793. Bonaventure cemetery, with its winding avenues of live oaks draped with Spanish moss, is one of the country's most beautiful burial grounds. Savannah has the oldest theatre in the U.S. in active use (established in 1818; destroyed by fire in 1948 but rebuilt in 1950), the oldest golf club (1811) and the oldest brick house in the state. The city itself is a favourite winter resort and there are many bathing beaches, fishing grounds and other pleasure resorts near by, including Tybee Island (5 sq.mi.) at the mouth of the Savannah river, Montgomery, Thunderbolt and Isle of Hope (where there is a diamondback terrapin farm). The United States department of agriculture has an experimental bamboo farm 12 mi. from the city. Hunter Air Force base is there.

Savannah is one of the leading southern Atlantic ports, and is the state port of Georgia. One-half of its water-borne commerce

at mid-20th century represented foreign trade, largely exports of raw cotton and naval stores. In 1949 the output of 300 manufacturing establishments situated within the city was valued at \$284,000,000. Its cotton warehouses can store more than 1,000,000 bales and the fuel oil storage plants have a capacity of about 71,000,000 gal. Chief among the manufactures are paper and paper products, fertilizers, rosin and turpentine, cottonseed products, sugar and chemicals. Leading fabricated products are aluminum and iron products, steel products, plywood products and concrete piping.

Bank debits exceed \$1,000,000,000 annually.

The first European settlement in Georgia was made at Savannah in Feb. 1733 by James Edward Oglethorpe. Charles and John Wesley arrived in 1735, and George Whitefield was there in 1738 and 1740–42. Until its capture by the British in the year 1778, Savannah was the seat of government of Georgia. The first legislature met there on Jan. 1, 1755; the first provincial congress on Jan. 18, 1775, and a second on July 4, soon after which the royal government collapsed and the city was administered by a council of safety. Loyalist sentiment was strong, and many families were divided among themselves. From Oct. 1776 to Feb. 1777 the convention which framed the first state constitution of Georgia was in session in Savannah, and the first state legislature assembled there in May 1778, but on Dec. 9 the British captured the city, and the seat of government was transferred to Augusta. In May 1782 the British evacuated, after a short siege by Gen. Anthony Wayne, and Savannah was again the capital for a few months. It was chartered as a city in 1789, and soon became a commercial rival of Charleston. In 1819 the first steamship to cross the Atlantic (the "Savannah," built by Savannah capital in the north) sailed from Savannah to Liverpool in 25 days. The convention which adopted Georgia's ordinance of secession met there in 1861. The port was blockaded by the federal government early in the war, and on Dec. 12, 1862, Fort Pulaski, commanding the channel at the mouth of the river, was forced to capitulate.

Savannah was the objective of Gen. W. T. Sherman's "march to the sea," and surrendered to him on Dec. 21, 1864.

SAVANTWADI, a native state of Bombay, India. Area, 937 sq.mi. Pop. (1941) 252,050. The surface is broken and rugged, interspersed with densely wooded hills; in the valleys are gardens and groves of coconut and betel-nut palms. Savantwadi has no considerable rivers; the chief streams are the Karli on the north and the Terakhil on the south. The climate is humid and relaxing, with an average annual rainfall of 150 in. The chief, whose title is *sar desai*, is a Mahratta of the Bhonsla family, who traces back his descent to the 16th century. The town of SAVANTWADI is picturesquely situated on the bank of a large lake, 17 mi. E. of the seaport of Vengurla. Pop. (1941) 10,024.

Before the establishment of Portuguese power Savantwadi was the highway of a great traffic between the coast and the interior; but during the 16th and 17th centuries trade suffered much from the rivalry of the Portuguese, and in the disturbances of the 18th century it almost entirely disappeared. In consequence of piracy, the whole coast-line (including the port of Vengurla) was ceded to the British in 1812.

SAVARY, ANNE JEAN MARIE RENÉ, DUKE OF ROVIGO (1774–1833), French general and diplomatist, was born at Marcq in the Ardennes on April 26, 1774. He was educated at the college of St. Louis at Metz and entered the royal army in 1790. He served under Custine on the eastern frontier in 1792, then under Pichegru and Moreau, and in 1798 under Desaix in Egypt, and in Italy. After Marengo Bonaparte gave him command of the gendarmes charged with the duty of guarding the First Consul. In the discovery of the various ramifications of the Cadoudal-Pichegru conspiracy Savary showed great skill and activity. He was in command of the troops at Vincennes when the duc d'Enghien (*q.v.*) was executed. In Feb. 1805 he became general of division. Shortly before the battle of Austerlitz (Dec. 2, 1805) he was sent by Napoleon with a message to the emperor Alexander I. with a request for an armistice, a device which precipitated the attack which brought disaster to the Russians.

After the battle Savary again took a message to Alexander, which induced him to treat for an armistice. In the campaign of 1806 Savary showed signal daring in the pursuit of the Prussians after the battle of Jena. Early in the next year he received command of a corps, and gained a success at Ostrolenka (Feb. 16, 1807).

After the treaty of Tilsit (July 7, 1807) Savary proceeded to St. Petersburg as the French ambassador, but was soon replaced by General Caulaincourt (*q.v.*), another accessory to the execution of the duc d'Enghien. But Napoleon needed him in Madrid. With the title of duke of Rovigo, Savary set out for Spain. With Murat Savary made skilful use of the schisms in the Spanish royal family (March–April 1808), and persuaded Charles IV., who had recently abdicated under *duresse*, and his son Ferdinand VII., the *de facto* king of Spain, to refer their claims to Napoleon. Savary induced Ferdinand to cross the Pyrenees and proceed to Bayonne—a step which cost him his crown and his liberty until 1814. In September 1808 Savary accompanied the emperor to the famous interview at Erfurt with the emperor Alexander. On the disgrace of Fouché (*q.v.*) in the spring of 1810, Savary received his appointment, the ministry of police. This office now became a veritable inquisition. Savary was among the last to desert the emperor at the time of his abdication (April 11, 1814) and among the first to welcome his return in 1815, when he became inspector-general of gendarmerie and a peer of France. After Waterloo he accompanied the emperor to Rochefort and sailed with him to Plymouth on H.M.S. "Bellerophon." He was not allowed to accompany him to St. Helena, but underwent several months' "internment" at Malta. Finally he was allowed to return to France and regained civic rights; later he settled at Rome. The July revolution (1830) brought him into favour and in 1831 he received the command of the French army in Algeria. Ill-health compelled him to return to France, and he died at Paris in June 1833.

See *Mémoires du duc de Rovigo* (4 vols., London, 1828; English edition also in 4 vols., London, 1828); a new French edition annotated by D. Lacroix (5 vols., Paris, 1900); *Extrait des mémoires de M. le duc de Rovigo concernant le catastrophe de M. le duc d'Enghien* (London, 1823); *Le Duc de Rovigo jugé par lui-même et par ses contemporains*, by L. F. E. . . . (Paris, 1823); and A. F. N. Macquart, *Réfutation de l'écrit de M. le duc de Rovigo* (1823).

SAVE or SAVA, a river of Yugoslavia and an affluent of the Danube. It runs almost parallel with the Drave, both having about the same length. The Save rises in the Triglav group in Carniola from two sources, the Wurzener Save and the Wocheiner Save, which join at Radmannsdorf. It then flows through Carniola and Croatia-Slavonia and joins the Danube at Belgrade. The Save has a length of 442 m., the area of its basin being 34,000 square miles. It is navigable for river steamers from Sisak to its mouth, a distance of 360 miles. (See DANUBE.)

SAVERNE or ZABERN, a town of France, capital of an arrondissement in the department of Bas-Rhin, on the Rhine-Marne canal and the Zorn, at the foot of a pass over the Vosges, and 27 mi. N.W. of Strasbourg by rail. Pop. (1946) 8,659. Saverne (*Tres Tabernae*) was an important place in the time of the Romans and, after being destroyed by the Alamanni, was rebuilt by the emperor Julian. It is interesting that, being an important point in the line of communications, it early became an ecclesiastical lordship, at first of the bishops of Metz but from the 13th century to 1793 of the bishops of Strasbourg. It suffered much during the Thirty Years' War, but the episcopal castle, then destroyed, was rebuilt later. There is a 15th-century church of a former Franciscan convent. The parish church has a 12th-century tower and 14th-century Gothic choir. Saverne is the seat of a subprefect and of a cantonal tribunal.

In November 1913 Zabern was the scene of a fracas which caused great bitterness in France and assumed the proportions of an international incident. A German lieutenant named Forstner grossly insulted Alsatian recruits, and a street riot followed. Twenty-nine persons were arrested. On Dec. 2 Forstner caused the arrest of a boy at Zettweiler and struck him with his sabre. The affair led to a vote of censure on Bethmann-Hollweg in the Reichstag, but the military party secured the acquittal of Forstner on appeal to the war council.

SAVIGNY, FRIEDRICH KARL VON (1779–1861), German jurist, was born at Frankfort-on-Main on Feb. 21, 1779. Left an orphan at the age of 13, he was brought up by his guardian until, in 1795, he entered the university of Marburg. After the fashion of German students, Savigny visited several universities, notably Jena, Leipzig and Halle; and returning to Marburg, took his doctor's degree in 1800. In 1803 he published his famous treatise, *Das Recht des Besitzes* (the rights of possession). In 1804 Savigny married Kunigunde Brentano, the sister of Bettina von Arnim and Clemens Brentano the poet, and the same year started on an extensive tour through France and south Germany in search of fresh sources of Roman law.

In 1810 he was called, chiefly at the instance of Wilhelm von Humboldt, to fill the chair of Roman law at the new university of Berlin. Here one of his services was to create, in connection with the faculty of law, a "Sprach-Collegium," an extraordinary tribunal competent to deliver opinions on cases remitted to it by the ordinary courts; and he took an active part in its labours. This was the busiest time of his life. He was engaged in lecturing, in the government of the university, and as tutor to the crown prince in Roman, criminal and Prussian law. In 1814 appeared his pamphlet *Vom Beruf unserer Zeit für Gesetzgebung und Rechtswissenschaft* (new edition, 1892), a protest against the demand for codification.

In 1815 he founded, with Karl Friedrich Eichhorn, and Johann Friedrich Ludwig Göschken (1778–1837), the *Zeitschrift für geschichtliche Rechtswissenschaft*, as the organ of the new historical school. In 1815 appeared the first volume of his *Geschichte des römischen Rechts im Mittelalter*, the last of which was not published until 1831. This work was originally intended to be a literary history of Roman law from Irnerius to the present time. As eventually completed, it left the narrative at the 16th century and the separation of Europe into national States.

In 1835 Savigny began his elaborate work on contemporary Roman law, *System des heutigen römischen Rechts* (8 vols., 1840–1849). In March 1842, he was appointed "Grosskanzler" (High Chancellor), the title given by Frederick II. in 1746 to the official at the head of the juridical system in Prussia, and he carried out several important law reforms in regard to bills of exchange and divorce. In 1848 he resigned and returned to jurisprudence. In 1850 appeared his *Vermischte Schriften*, consisting of a collection of his minor works published between 1800 and 1844. In 1853 he published his treatise on Contracts (*Das Obligationenrecht*), a supplement to his work on modern Roman law, in which he clearly demonstrates the necessity for the historical treatment of law. Savigny died at Berlin on Oct. 25, 1861.

Savigny belongs to the so-called historical school of jurists, though he cannot claim to be regarded as its founder, an honour which belongs to Gustav Hugo. In the history of jurisprudence Savigny's great works are the *Recht des Besitzes* and the *Vom Beruf* above referred to. The former marks an epoch in jurisprudence. Professor Jhering says: "With the *Recht des Besitzes* the juridical method of the Romans was regained, and modern jurisprudence born." Savigny sought to prove that in Roman law possession had always reference to "usucaption" or to "interdicts"; that there is not a right to continuance in possession but only to immunity from interference; possession being based on the consciousness of unlimited power.

The *Beruf unserer Zeit*, in addition to the more specific object the treatise had in view, which has been already treated, expresses the idea, unfamiliar in 1814, that law is part and parcel of national life, and combats the notion, too much assumed by French jurists, especially in the 18th century, and countenanced in practice by Bentham, that law might be arbitrarily imposed on a country irrespective of its state of civilization and past history.

See Biographies by Stinzing (1862); Rudorff (1867); Bethmann-Hollweg (1867); and Landsberg (1890). See also ROMAN LAW.

SAVILE, SIR GEORGE (1726–1784), English politician, was the only son of Sir George Savile, Bart. (d. 1743), of Rufford, Nottinghamshire, and was born in London on July 18, 1726. He entered the House of Commons as member for Yorkshire in 1759. In general he advocated measures of relief to Roman Catholics

and to Protestant dissenters, and he defended the action of the American colonists. He refused to take office and in 1783 he resigned his seat in parliament. He died unmarried in London on Jan. 10, 1784. Horace Walpole says Savile had "a large fortune and a larger mind"; Burke also had a very high opinion of him.

SAVILE, SIR HENRY (1549–1622), warden of Merton College, Oxford, and provost of Eton, was the son of Henry Savile of Bradley, near Halifax, in Yorkshire. He was educated at Brasenose College, Oxford, where he matriculated in 1561. He became a fellow of Merton in 1565, proceeded B.A. in 1566, and M.A. in 1570. He established a reputation as a Greek scholar and mathematician by voluntary lectures on the *Almagest*, and in 1575 became junior proctor. In 1578 he travelled on the continent of Europe, where he collected manuscripts. On his return he was named Greek tutor to the queen, and in 1585 was established as warden of Merton. He proved a successful and autocratic head under whom the college flourished. A translation of four Books of the Histories of Tacitus, with a learned *Commentary on Roman Warfare* in 1591, enhanced his reputation. On May 26, 1596 he obtained the provostship of Eton, the reward of persistent begging. In February 1601 he was put under arrest on suspicion of having been concerned in the rebellion of the earl of Essex. He was soon released and his friendship with the faction of Essex brought him the favour of James I.

In 1604 Savile was knighted, and in that year he was named one of the body of scholars appointed to prepare the authorized version of the Bible. He was entrusted with parts of the Gospels, the Acts of the Apostles and the Book of Revelation. His edition of Chrysostom (8 vols., fol. 1610–13) was printed by the king's printer, William Norton, in a private press erected at the expense of Sir Henry, who imported the type. At the same press he published an edition of the *Cyropaedia* in 1618. In 1619 he founded and endowed the Savilian professorships of geometry and astronomy at Oxford. He died at Eton on Feb. 19, 1622.

See W. D. Macray, *Annals of the Bodleian Library* (1868); Sir N. C. Maxwell-Lyte, *History of Eton College* (3rd ed., 1899); and John Aubrey, *Lives of Eminent Men* (1898).

SAVINGS BANKS. A savings bank is one of the many institutional arrangements that society makes in order to bring together lenders and borrowers of funds. Although it is customarily looked upon as an agency utilized by individuals who wish to accumulate funds for future spending, the savings bank is also a lending institution and could not exist in its present form were it not. It performs an important economic function in its dual capacity of borrowing from individuals who wish to consume less than their income and of lending to others who wish to spend more. It is one of a number of institutions that serve to direct the flow of money income in such a way that a portion of the economic resources of a society are turned from the production of goods for current consumption to the creation of an addition to its total stock of capital, or its wealth.

As an agency of savings, the bank facilitates the process by which an individual voluntarily abstains from spending the total of his current income in order to accumulate claims against future income. As a lending agency, the savings bank assists individuals or groups who wish to spend more than their current income by promising to spend less than their future income. It is, then, an institution which brings together those who have more than enough for their current needs and those who have less than enough. It performs its economic function by exchanging future and present claims. An individual who makes a savings deposit sells his present claim against income currently produced for a claim which is redeemable at some future date; that is, he exchanges a portion of his current money receipts, which are redeemable in goods and services, for a savings deposit which will be withdrawn and redeemed at some future date. The evidence of the savings depositor's claim is his passbook. An individual or a group that wishes to borrow sells claims against future income—the evidence for which is some kind of a promise to pay—for claims against present income. The consequence of such transactions is the promotion of "real" saving, which is an increase in capital, as distinguished from "money" saving, which can be

merely the act of not spending, or of hoarding.

There are other institutions than savings banks which perform a similar economic function in their dual capacity of receiving deposits (*i.e.*, of borrowing) and making loans. The most important of these are the savings departments of commercial banks; building and loan, or savings and loan, associations; insurance companies; investment trusts; and a number of minor (in terms of magnitude of deposits) of savings institutions, such as credit unions and similar co-operative credit organizations, industrial savings plans, and school savings programs. The act of bringing together saver and spender, or lender and borrower, need not be the work of an intermediary agency but the product of a direct relationship—a consideration that is of ever greater concern to savings banks. Individuals who wish to save may purchase claims against future income directly from those who wish to borrow and will guarantee the redemption of the claims, the evidence of the transactions being a share, bond or other security. It is shown below (Table II) that the proportion of individual saving that is done by the direct purchase of securities is increasing.

History.—Savings banking is the product of two historical forces, one of which operated uniquely to create it alone and the other to create all savings institutions. The development of a liberal economic order, based upon specialization and exchange, presupposed an effective supply of money, in the creation of which all credit institutions participated. Such an order (dating from about 1550) carried with it certain ethical presuppositions concerning the nature of man, among which was the notion that he was capable of looking after himself amid the uncertainties of a market system. Savings banking, then, in addition to being one of the many credit institutions which an exchange economy finds indispensable is also a product of the effort to secure the individual against the caprices of capitalism. Not long in coming was recognition of the fact that if individuals were to be considered self-responsible they must have institutions enabling them to provide for such uncertainties as they might encounter. The original plans for savings banks were more than tinged with a spirit of benevolence and paternalism emanating from the more fortunate members of the community who wished to help the poor and at the same time relieve themselves of the burden of charity.

In 1610, the Frenchman, Hugues de Lestre, published a treatise in which he urged the establishment of savings institutions for the poor in order that their lot might be bettered and that the rich might avoid the necessity of alms-giving. Seventy-seven years after, the irrepressible Daniel Defoe, finding himself in a debtor's prison, wrote a tract on the wonders that could be wrought by the practice of thrift. To this end, he proposed that the government establish a pension office. If each person in the realm—rich and poor, of all ages—were to pay each year four shillings into a common fund husbanded by the state, they could "forever banish beggary and poverty out of the kingdom." Such a happy state could be purchased for the price of "two pots of beer a month." While the French and English continued to write about savings banks, elsewhere in Europe they were developing out of the municipal pawnshops, the most famous of which was the *Monte de Pietà* that for centuries operated in the Italian city states as a savings and loan agency. The eventual product of this development was the municipal savings bank. Almost concurrent was the development of private savings banks in Germany, the first of which began in Hamburg in 1778.

The first savings bank in Britain was founded in 1810 by the Rev. Henry Duncan, pastor of an impoverished flock in Dumfriesshire, Scotland. Duncan, who had been a student of the classical economist, Dugald Stewart, established the "Savings and Friendly Society," the members of which were divided into three classes: ordinary, who made regular deposits; extraordinary, who contributed to a surplus fund out of which premiums were paid to encourage frequent deposits; and honorary members. The bank was not operated for profit, and its officers devoted their time to its governance as a philanthropic service. Penalties were imposed upon those who did not deposit regularly, and ordinary members who wished to withdraw their savings had first to obtain the permission of the "Court of Directors" of the society. Duncan's

bank was the origin of the trustee savings banks in the United Kingdom and of the mutual savings banks in America. Its success was soon indisputable, and by 1827 the plan had spread over Scotland, England and Ireland where £15,000,000 had been deposited. Most of these banks were motivated by a mixture of benevolence and economic insight. They soon became subject to governmental regulation, and in 1863 the Trustee Savings Bank act was passed. In 1861 the post office savings bank system was inaugurated, under the auspices of Gladstone, and the trustee banks declined in relative importance.

The origin of savings banking in the United States was quite similar to that in Britain, for the first banks were non-profit institutions founded for charitable purposes. The original bank was the Provident Institution for Savings, of Boston, which received its charter in December 1816. One month earlier, the Philadelphia Saving Fund society began business but was not incorporated until 1819. The Bank for Savings of New York, was incorporated in 1819 by the Society for the Prevention of Pauperism. The founders' roll of American savings banks includes a number of men of some historical importance, such as Condé Raguet, Thomas Eddy, James Savage, and Clement and Alexander Bidle. Out of these early organizations developed the mutual savings banks of America which are still largely confined to their place of origin in the north Atlantic states. Their growth was unexceptional until the decade preceding the Civil War when the number of banks increased from 108 to 300, the number of depositors from 250,000 to 700,000, and total balances from \$50,000,000 to \$150,000,000. By 1875 this latter figure had risen to \$900,000,000 and by 1913 to almost \$5,000,000,000—even though the period between the close of the Civil War and the turn of the century was one of falling prices.

The success of mutual banks resulted in the creation of additional savings institutions, but the mutual structure was not copied by the new banks, which began in the middle and far western states. These were organizations operated for profit and managed in the interest of the shareholders. Stock savings banks were established, and commercial banks began to accept savings deposits toward the end of the 19th century. Prior to 1913, however, the national banks (*see BANKING AND CREDIT: United States*) did not distinguish between savings, or time, deposits and demand deposits, because there was no legal basis for such a distinction in the National Bank act under which they operated. Their acceptance of savings deposits brought them into competition with the mutual, stock and state banks. When the federal reserve system was established in 1913, a distinction was made between kinds of deposits, and a lower reserve requirement was fixed for time deposits—those which could be withdrawn only after prior notice has been given.

The proliferation of savings plans late in the century brought a demand from many quarters for the institution of a savings system under the control and operation of the post office, and in 1910 the postal savings system was started.

In the entire history of savings banks, the inter-war period was the most eventful. Like other banks they reeled under two, near-fatal, blows. The first of these was the monetary disorder that fell upon almost every nation, in the reckless depreciation of currency and its irresponsible aftermath. The effect was to shake the confidence of the people in the value of money and to evoke a flight from currency to the hoarding of goods. In such circumstances, it is suicidal for an individual to abstain from current consumption in order to accumulate claims against future income, for the claims which the bank hands over to him may be worthless. That this was well realized in Germany—where inflation drove the mark down to one one-billionth of its original value—is evident in the decline of savings bank deposits from 19,700,000,000 gold marks in 1913 to 4,600,000,000 gold marks in 1927. Inflation or the fear of inflation—which ever verges upon the probable in a world of budgetary disorder—will produce a flight from the currency and the disorganization of banking.

The second catastrophe was the great depression of 1929. Depression, or deflation, produces a movement away from the holding of stocks of goods to the hoarding of money, and as the

movement gains momentum these hoards are withdrawn from the banks and held privately. Concurrent with the heavy withdrawal of deposits after 1929 was a substantial decline in the value of bank assets, making it impossible for many banks to meet their obligations to depositors. The failure of thousands of banks created suspicions about the soundness of others until they, too, failed. The crisis reached its climax in the United States when *all* banks were closed by presidential decree in the spring of 1933 and later re-opened under new conditions. The effect of the depression, particularly in the United States, was to disturb profoundly the confidence of the people in the banking system and to disclose the inadequacy of conventional standards of bank management. It demonstrated that even the most scrupulous practices in maintaining required reserves and holding only prescribed investments did not render a bank capable of meeting all of its obligations when all depositors demanded payment and when earning assets were shrinking in value.

In the course of some 130 years both the purpose and practice of savings banking have changed drastically, and in these changes are reflected the changing character of individual saving habits. The banks are no longer benevolent institutions created by the wealthier members of the community for the succor of their less fortunate fellow citizens. They are avowed profit-making enterprises, as in the case of commercial banks engaging in the savings deposit business, or co-operative agencies, or public institutions operated by local or national governments. In the eastern United States where mutual savings banks still flourish, their early overtones of philanthropy and paternalism have passed away. Savings bank practices have also changed. Originally the monies received from depositors were invested in government securities, which were long in maturing, comparatively safe and bore a low rate of interest. Today savings deposits are invested as well in the securities of private enterprises, and, in the case of commercial banks in the federal reserve system and of most state banks, they may be loaned out for short periods to businessmen. That banking law now permits deposits to be invested in more venturesome enterprises, which while more profitable are more risky, is more important than that most banks now hold a large proportion of their earning assets in the form of government securities.

A stable postwar world, with a great demand for capital, can repeat the experience of the period following World War I when banks eagerly sought after deposits and offered numerous inducements to save. Not only was the rate of interest on savings deposits then incredibly high (when compared to what the founders of savings banking thought desirable) but the banks sought out custom by establishing financial services for their depositors. Since the beginning of the 20th century savings banks have encountered mounting competition from other outlets for individual savings, such as insurance companies, postal savings banks, investment trusts, co-operative agencies, and, greatest of all, from governments seeking to borrow from individuals. Finally, it should be noted that changes in the savings habits of individuals have lessened the permanence of their deposits. Studies made of the decade from 1930 to 1940 disclose that in the United States the majority of deposits were made, not as security against misfortune and old age, but for future spending anticipated with a considerable degree of certainty, with the consequence that the rate of turnover of deposits is antithetical to what were once conceived to be proper savings practices. In one important American bank—believed to be representative of many others—three-fourths of all savings deposits were withdrawn before they were five years old. It has also been discovered that in this decade the amount by which savings deposits increased was only a little greater than the amount of interest earned on the principal, which indicates, in effect, that individual savings deposits contributed in this period virtually none of the funds used in the formation of capital in the United States.

All of these changes are symptomatic of the changing character of individual savings. The causes which once compelled an individual to lay aside funds for a rainy day have either disappeared or have found a different expression. The uncertainty that once

haunted members of western, industrial society has become less terrible as governments have assumed the responsibility of looking after the jobless, the aged and the infirm—a development that is signalized by social security legislation and the socializing of charity. Moreover, those individuals who are able to invest against misfortune have alternative methods of doing it, such as purchasing insurance policies or, simply, securities of enterprises or governments. Savings deposits are still useful for accumulating funds for large expenditures—as for education and travel—but even for this purpose they are not as essential as they once were. The development of mass credit institutions—installment selling, small loan agencies, and the like—has diminished the necessity of saving to spend. Finally, the very notion of thrift has lost much of its enticement, because the contemporary man discounts the future at an inordinately high rate. He is a victim of what Adam Smith called "the passion for present enjoyment," and is refractory to the very instinct which Smith believed would redeem him—the desire to save which "comes with us from the womb, and never leaves us till we go into the grave." Not only does thrift no longer keep its high place among the cardinal virtues but is often looked upon as a pernicious practice by many of those very people who were once among its arch-advocates: the economists.

SAVINGS BANKING IN THE UNITED STATES

Savings banks in the United States are of three principal kinds: mutual savings banks, commercial banks and postal depositories.

Mutual Banks.—The unique characteristic of the mutual system is its ownership and management. Such banks are, in essence, owned by the depositors and managed in their interest by non-depositors. The banks have no capital stock, and the funds for their operation are obtained solely from individual deposits. No fixed rate of interest is paid on deposits, but the earnings from their investments are distributed to individuals in proportion to the size of their deposits. Because they were designed originally to encourage thrift among persons with low incomes, a maximum was fixed to the size of each deposit and individuals were allowed only one account. Notice of withdrawal must be given and no deposits are subject to cheque. Because of limitations on the turnover of deposits, the mutual banks are not required to keep a fixed cash reserve against their liabilities (deposits). A hybrid form of the mutual and stock bank is the guaranty savings bank, which exists only in the state of New Hampshire. It accepts two classes of deposits: regular, on which a stipulated rate of interest is paid, and special deposits, which receive any excess of earnings after the regular depositors have been credited. These special deposits are conceived of as a fund for "guaranteeing" the regular deposits and they are very similar to the capital stock of stock banks.

Commercial Banks.—Stock savings banks are privately owned and operated organizations, which obtain their initial funds from the sale of capital stock and pay dividends on it. Depositors receive a fixed rate of interest. These banks have lost the pronounced savings character they once had and have become very similar in function and operation to commercial banks and trust companies. Since 1936, the Comptroller of the Currency has made no distinction in his annual reports between stock savings banks and state commercial banks.

The importance of the savings departments of commercial banks, both state and national, has increased until they now hold the greatest portion of all individual savings deposits. (See Table I.) Commercial banks are private organizations (subject, of course, to regulation) and obtain their initial funds from stock sales. They accept short and long term liabilities (demand and time deposits, respectively) and deal in short and long term investments, although there is no necessary correspondence between the duration of kinds of liabilities and assets. Interest is paid on savings deposits, subject either to the discretion of the management of the bank or to the control of a supervisory body like the federal reserve system (*q.v.*). The amount of interest paid on savings, or time, deposits is not solely determined by the earnings of the assets purchased with them but by the earnings of the de-

mand deposits as well. Following World War I, the commercial banks in vigorously seeking funds to invest introduced a number of variants on traditional savings procedures, like Christmas savings, vacation clubs, insured savings (combining life insurance with savings), and they relaxed the conditions on time deposits, not only permitting their withdrawal without previous notification but also the drawing of cheques against them.

Postal Savings.—The postal savings system, finally inaugurated in 1910 after a protracted campaign which met with the active opposition of the established banks, is the least important of the three types of savings banks in terms of total deposits. It was finally instituted in the belief that it would not compete directly with other institutions because it would attract deposits from those persons who, having no confidence in the traditional banks, would either not save at all or, in the case of immigrants, would send their savings to postal savings institutions in Europe. Deposits are accepted from all persons over 10 years of age, but no one may have a total deposit of more than \$2,500. Interest on deposits is 2%. Instead of the customary passbooks, depositors receive non-negotiable certificates as evidence of their claim. Deposit certificates in denominations of \$20 or more are exchangeable for United States securities bearing interest of 2.5%. The system is required to keep reserves of 5%, in lawful money with the treasury. The balance of the total deposits is either redeposited in commercial banks, especially federal reserve member banks under special surety, or it is invested in government bonds.

TABLE I—Individual Savings Deposits in the United States (1913-1941)

Year	Total savings in all banks	Commercial banks	Mutual banks (In thousands of dollars)	Postal savings	Per capita money savings	Per capita real savings
1913	8,295,950	4,349,727	3,768,947	33,819	\$86.33	\$99.64
1918	10,000,933	6,464,972	4,344,167	148,471	97.13	59.60
1924	10,147,616	11,440,234	6,686,366	132,814	170.15	139.73
1927	26,179,360	16,905,264	8,077,099	147,359	222.51	187.90
1930	27,420,815	18,012,768	9,190,969	175,272	221.33	206.37
1933	20,059,072	9,701,669	9,699,509	1,187,183	164.51	201.11
1936	23,665,183	12,669,371	10,037,169	1,231,646	187.15	186.78
1939	25,524,821	13,869,246	10,382,238	1,202,292	195.02	203.78
1941	26,484,899	14,667,193	10,502,797	1,304,153	199.70	184.40

Source: *Annual Reports of Comptroller of the Currency and the Postmaster General*. Total savings deposits comprise all individual deposits in commercial banks (as defined below), mutual and private banks, and in the postal savings system.

Commercial bank deposits consist of all individual time deposits in all national and state banks (including stock banks), and in loan and trust companies.

The adjustment of per capita money savings to real savings is made by dividing the former by the wholesale price index of bureau of labor statistics with base in the years 1935-39.

Savings Trends.—The quantitative importance of the three kinds of saving banking in the United States, together with changes in average deposits, is shown in Table I. The most important factors behind the increase in total deposits are the growth of real income and the continued development of the banking system. Of the three classes, postal deposits show the most rapid growth, particularly after 1930 when the thousands of commercial bank failures drove individuals to seek security in a government institution. The table would indicate the permanence of the increase, which at the time of its occurrence was believed to be a temporary, depression phenomenon. The figures of per capita money deposits are obtained by dividing total deposits by the total population for the given years. Per capita real deposits are money deposits adjusted for price changes, a figure which expresses an equivalent of goods and services valued at prices prevailing between 1935 and 1939. Thus, the money savings figure for 1941 denoted that each person in the United States held, on an average, in the form of a savings bank deposit a command over a quantum of goods and services valued at \$199.70 at then current prices. However, the value of the same amount of goods and services, between 1935 and 1939, was only \$184.40. The data of Table I show only the amount of individual saving effected through savings banks.

The total of all individual long term saving is given in Table II, in absolute and relative amounts. In this compilation is revealed the declining importance of banks as agencies for drawing off individual savings. At the date of the last computation, the banks took less than one-half of the total. The most marked increase, and one which portends to be of even greater importance,

is in the holdings of government securities, which includes savings and war bonds. (The figure for commercial bank deposits in Table I differs from that in Table II by the amount of savings and loan deposits shown separately in the latter.)

TABLE II—Individual Long-Term Savings in the United States (1936-1941)
(In millions of dollars)

	1936		1939		1941	
	\$	%	\$	%	\$	%
Total	43,644	100.0	51,193	99.9	58,186	100.1
Life insurance companies	19,133	43.8	23,381	45.7	26,877	46.2
Mutual savings banks	10,037	23.0	10,382	20.3	10,503	18.1
Commercial banks	8,220	18.8	9,457	18.5	9,752	16.8
Building and loan associations	4,449	10.2	4,412	8.6	4,915	8.4
Postal savings	1,231	2.8	1,262	2.5	1,304	2.2
2½% postal savings bonds	99	.23	90	.17	85	.15
U.S. savings bonds	475	1.1	2,209	4.3	4,750	8.2

Source: *Statistical Abstract of the United States, 1942* and *Annual Reports of Comptroller of the Currency*.

Building and Loan deposits are here separated from Commercial Bank deposits; hence the difference in the figures for Commercial Bank deposits in Tables I and II.

Regulation.—Governmental scrutiny of savings banks focuses primarily on their investment policies, and most regulatory measures are concerned with prescribing them. The problem of investing assets is one of selecting securities which are comparatively free of risk, are readily salable on the market without loss, and are profitable. Most regulations have the effect of pursuing the first two of these criteria and prescribe, as a rule, long term, fixed interest bearing securities, viz. the bonds of federal, state and local governments, of railroads, public utilities, and, in addition, collateral loans and mortgages. Such narrowing of the range of purchasable securities forces up their price and lowers their yield. Apart from the administrative problem created for the banks in finding legitimate investments—which is aggravated in a world of shrinking investment opportunities—these regulations disturb the equilibrium of relative prices among securities and tend to produce a poor allocation of capital expenditure, the consequence of which is a lower standard of living than is otherwise obtainable with a given set of economic resources. All of the United States, with the exception of Maryland and Delaware, regulate the investments of savings banks and certain of the states prescribe the way in which the savings deposits of commercial banks may be invested. In this latter category is California, whose banking law is often held up as a model. By its provisions a bank may engage in three types of banking: savings, commercial and trust. Each department, however, must be completely independent of the others, its assets and liabilities completely segregated and subject to different sections of the law. The savings departments are governed separately as to their deposits, reserves, interest, investments, and as to all transactions—the purpose being to prevent the demand depositors from draining the banks of their liquid assets in a critical period while the savings depositors are biding the notification period prior to withdrawal. The rigour of a law like that of California has been rendered less necessary by the establishment of the Federal Deposit Insurance corporation under which a bank may insure all deposits up to \$5,000. Its necessity has not disappeared, however, for it is the withdrawal of the large, uninsured, deposits that usually weaken a bank and lead to failure.

The insuring of deposits has had greatest effect on the savings departments of commercial banks, but slight effect on the mutual banks, and none, of course, on the postal savings system since its liabilities are guaranteed by the government. When the F.D.I.C. was established in 1934 most of the mutual banks affiliated with it but later discontinued their membership. Most of these banks considered the insurance premiums too high in view of all their liabilities being time deposits (and not subject to immediate withdrawal) and of the limit on the amount that can be held by any depositor. To provide for such emergencies as the banking crisis of 1932 and 1933, the mutual banks in five eastern states (New York, Massachusetts, Connecticut, New Hampshire and Maine) have established central organizations which are prepared to extend loans and/or discount mortgages. Similarly, the opening of membership in the federal reserve system to mutual banks has had little effect on them.

SAVINGS BANKING IN GREAT BRITAIN

There are three main forms which individual savings take in Great Britain: deposits in the postal savings system, deposits in trustee banks, and purchase of National Savings certificates. Unlike the American system, there is no limit to the size of individual balances in the postal savings system, although the sum of all deposits made in one year cannot exceed £500. Interest is paid at the rate of 2½% annually. The monies received by the system are re-deposited with the Bank of England which places them in government securities. (See POST AND POSTAL SERVICES: *The British Post Office as Bunker*.) The British trustee savings banks are quite similar to the mutual banks of America. All assets are vested with the trustees of the banks and all deposits, other than small working balances, must be paid into the trustees account with the Bank of England, which invests them in government securities. The trustees of the banks are not permitted to profit from the operation of the institutions. Joint stock banks accept savings deposits of £1 or more and return interest at the regular rate on all deposits. Other minor savings institutions are the building and the co-operative societies.

TABLE III—Individual Savings Deposits in Great Britain (1913–1941)

Year	Total savings * (In millions of pounds)	Trustee	Postal	Savings certificates	Per capita money savings £	Per capita real savings £
					5.35	6.35
1913	255.7	68.5	187.2	—	—	—
1924	847.7	107.0	280.4	460.3	18.82	13.51
1927	884.5	113.9	284.6	486.0	19.38	16.25
1930	923.4	133.2	290.2	500.0	20.10	19.95
1933	982.6	170.5	326.7	424.4	21.09	24.43
1936	1,156.4	211.8	432.4	512.2	23.52	24.71
1939	1,341.4	249.2	551.3	540.9	28.10	27.19
1941	2,072.1	326.8	822.9	922.4	43.30	31.50

Source: *Statistical Year-Books of the League of Nations*.

Until the outbreak of the war in 1914, the postal savings system was of greatest importance as an outlet for individual savings. During the war the government introduced National Savings certificates as a method of financing the war without producing inflationary pressures. They immediately took the greatest portion of individual savings and have retained their pre-eminence. Table III denotes the amount of savings entering each of three classes, revealing that savings certificates summed to about half the total of all savings and were three times as large as deposits in trustee banks. The per capita savings figures are analogous, though not strictly comparable, to those of the United States (*cf.* Table I). The money figure is equal to the total of savings divided by the total population, and per capita real savings are money savings adjusted for price changes. Thus, in 1941, each individual in the United Kingdom held in the form of average money savings balances a command over goods and services valued at approximately £44 7s., the value of which between 1935 and 1939 was, however, only £33 9s., which is the figure for per capita real deposits. This later figure represents an increase of about 400% over the real value of balances held in 1913. Per capita deposits in Britain are not strictly comparable to those in the United States, because they include holdings of government securities which the American figures do not.

SAVINGS BANKING IN GERMANY AND FRANCE

Germany.—It was in Germany prior to 1939 that the savings banking system was better organized than anywhere in the world. The municipal and co-operative agencies, as well as the privately owned savings banks, had reached a high state of development prior to the war. Of major importance among the co-operatives were the Raiffeisen and Schulze-Delitzsch (q.v.) organizations, the former supplying urban credit and the latter, rural credit. In most cities and towns, public savings banks had been formed by the municipal authorities, who were responsible for the administration of the bank and guaranteed its liabilities. The rate of interest paid on deposits was customarily higher than that paid by other banks. Their earning assets were held largely in the form of municipal securities. Joint stock banks also accepted savings deposits. The practices of the German savings banks differed basically from those in England and America in that they included many functions ordinarily performed by commercial banks, including the acceptance of checking deposits and the establishment of a clearing system. The accession to power of the National Socialist party, in 1933, evoked a re-organization of the banking system of Germany. The total organization was known as the Reichsgesellschaft Banken, consisting of six sections, one being the Deutscher Sparkassen und Giroverband with which all savings banks were affiliated.

France.—In France, there are two major savings institutions and a shoal of smaller ones. Most individual savings, prior to World War II, were deposited either with the Caisse Nationale, or the *caisses d'épargne ordinaires*. These are, respectively, the postal savings system, which was founded in 1851, and the ordinary, or private, savings banks, the first of which began in 1835. The postal system absorbs fewer individual savings than the privately owned banks, the proportion of deposits between them being roughly two to three in the decade prior to 1939. A popular feature of the postal savings system is its acceptance of checking deposits. To handle the funds received by the two major

TABLE IV—Individual Savings Deposits Throughout the World (1938)

Country	Monetary unit	Savings (millions)			Per Capita Savings	
		Total	In savings banks	In commercial banks	In national currency	In U.S. dollars
Switzerland	franc	6,602	1,829	4,773	1,568.17	354.66
Belgium	belga	15,156	13,435	1,721	1,807.30	304.35
Sweden	krona	7,410	4,302	3,108	1,174.32	282.42
New Zealand	pound	106	74.6	30.9	65.31	244.82
Australia	pound	445	243.6	201.3	64.21	230.00
Denmark	krone	3,936	2,285	1,651	1,037.70	216.26
United States	dollar	23,011	—	—	177.00	177.00
Canada	dollar	1,761	101	1,660	150.46	154.99
United Kingdom	pound	1,265	1,265	—	26.58	124.14
Netherlands	guilder	1,721	1,721	—	197.20	197.20
Germany	mark	21,051	19,803*	1,248	265.80	106.53
Finland	markka	18,882	10,439	8,443	5,160.43	160.30
Spain	peseta	4,417	3,083†	1,334	172.53	86.27
Czechoslovakia	koruna	35,149	28,493	6,650	2,300.52	78.83
Japan	yen	15,279	6,940	8,333	210.00	57.14
Italy	lire	46,308	46,308	—	1,066.27	56.09
France	franc	65,766	63,501	2,175	1,560.60	41.20
Argentina	peso	2,933	228.6	1,804	156.90	35.66
Hungary	pengö	1,236	419	817	121.34	35.37
South Africa	pound	76	27.4	48.6	7.55	34.90
Greece	drachma	13,551	6,478	7,073	1,900.44	10.40
Poland	zloty	2,019	2,302	617	83.10	15.69
Chile	peso	1,807	1,122	685	380.80	12.16

*1937 †1935

Source: Computed from the *Statistical Year-Book of the League of Nations, 1939–1941*.

banks, the Caisse des Dépôts et Consignations was established. Other outlets for individual savings are the six great commercial banks, with their thousands of branches, and the many small commercial banks operating in local markets. Still others are the investment banks (*banques d'affaires*), the mortgage banks, the co-operative credit banks (*banques populaires*), and the innumerable private savings societies (*les fourmis*) which accept regular small deposits and repay them on a fixed date, much like the Christmas and vacation clubs in America. Finally, it should be noted that the proverbial thrift of the Frenchman is often practised by hoarding gold coins, particularly in rural areas, a fact which is important in assessing the total of individual savings.

Russia.—In Russia savings banks got a slow start so that as late as 1870 the country did not have more than 65 such institutions. Intent on fostering capital formation from domestic sources, the tsarist government took over the savings banks in 1895 and undertook to guarantee all deposits. In 1918, after the revolution, savings banks were dissolved but were re-established in 1922. Since then savings deposits, encouraged by the state, experienced a phenomenal growth, exceeding 3,000,000,000 roubles in 1936.

Table IV is a comparison of savings deposits among those countries of the world for which data of any meaning are available. The comparison is made for the year 1938, the last year in which anything approximating normal conditions prevailed. The per capita savings deposits are obtained by dividing the total of savings deposits by the total of population, which is a smaller figure than the average amount held per depositor (since everyone does not have a savings deposit). The per capita figure is given first in units of the national currency and then in the equivalent dollar value. The conversion is made at the fixed rate of exchange for those countries which did not permit free fluctuations of exchange rates. The total figure is the sum of time deposits held in savings and commercial banks; it does not include direct investment in securities. It will be observed that the amount of savings deposits per person is greatest in Switzerland and Belgium and least in Poland and Chile, and that the countries commonly accepted to be the most wealthy and economically advanced are not among the first five in order of magnitude of per capita deposits. For this, there are two reasons: In nations like the United States and Britain, large amounts of individual savings are held outside the savings banks, hence would not figure in the data of the table. Secondly, the size of per capita deposits in those countries at the head of the list tends to be exaggerated because they are not strictly comparable (despite all possible adjustments) to the deposits of the great nations. A certain portion of savings deposits in the smaller European countries are simply cash balances for current needs, because the habit of holding checking accounts is not highly developed. Conversely, a small per capita deposit for nations at the bottom of the tabulation does not necessarily indicate an inability to save. In countries where the banking system is not highly developed, or where it does not have the full confidence of the populace, individuals may save by hoarding cash in the form of metallic money, foreign or domestic currency. Despite these necessary qualifications, the table is valuable for comparative purposes, in indicating differences in savings habits and savings practices.

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(W. D. G.)

SAVINKOV, BORIS (pen-name, Ropshin) (1879–1925), Russian revolutionary, joined the socialist-revolutionary party at the beginning of the 20th century and reached a high position in the councils of the party, becoming one of the five members of its "Militant Organization" and thus jointly responsible with the other members of that committee for the planning and execution of numerous terrorist assassinations. During the years immediately preceding 1914 he withdrew from active membership of the party, and in his novel *The White Horse* revealed a deeply pessimistic view of the position of the "intelligentsia" in pre-war Russia. From 1914 onwards he took a strongly pro-war attitude, and after the February 1917 revolution he became Kerensky's able assistant, holding the position of vice-minister for war in the 2nd coalition government of August. He played an equivocal part in the Kornilov affair, and after the Bolshevik revolution devoted himself to anti-Soviet activities. He was caught by the G.P.U. secretly entering Soviet Russia for purposes never clearly elucidated, was brought to trial in Moscow for his anti-Soviet activities, and was sentenced to ten years' imprisonment. He died in prison in 1925.

SAVOFF, MICHAEL (1857–1928), Bulgarian general and statesman, after three years in the Russian Staff academy in St. Petersburg, became a captain in the Bulgarian army when, on the outbreak of war with Serbia, he commanded one wing of the Bulgarian army at their brilliant victory of Slivnitsa. In 1887 he was appointed assistant to the minister of war, and in 1891 minister. He resigned in 1897, but after a further period in the army, and as commandant of the military academy at Sofia, he again held the same office in 1902 in Petroff's cabinet. The military law of 1904 was largely due to him. He retired into private life in 1908, but was appointed commander-in-chief of the Bulgarian army during the 1st and 2nd Balkan wars (1912–13). Savoff signed the orders of June 29, 1913, commanding the Bulgarian Fourth army to attack the Greek and Serbian force, thus opening the second Balkan War. For this he was recalled and an enquiry opened which was, however, never concluded; Savoff declared that the order had been given him by King Ferdinand. Although holding no command in World War I, owing to ill health, he strongly urged that Bulgaria join the Central Powers in order to recover Macedonia from Serbia. In Sept. 1918 he returned to Bulgaria from abroad in an attempt to overthrow the Malinoff cabinet, and keep Bulgaria in the war, but found that King Ferdinand had already abdicated. On Oct. 22, 1922, he was appointed Bulgarian minister in Paris, but retired after the anti-Agrarian *coup d'état* of June 9, 1923. He died on July 22, 1928, at Vallier-de-Thiey, Alpes-Maritimes.

SAVOIE, a department of France, formed in 1860 of the old provinces of Haute Savoie, Savoie, the Tarentaise and the Maurienne, which constituted the southern portion of the duchy of Savoy. It is bounded north by the department of Haute-Savoie, east and southeast by Italy, southwest by the department of the Hautes Alpes, and west by those of the Isère and the Ain. Pop. (1936) 239,010; area 2,389 sq.mi. It is mainly made up of the basin of the Isère. Probably the Isère formerly communicated with the Rhône past Chambéry and the Lac du Bourget. The sources of the Isère and of the Arc are separated by the ridge of the Col du Mont Iseran (9,085 ft.). The loftiest points are the Grande Casse (12,668 ft.), the culminating summit of the Vanoise group, the Mont Pourri (12,428 ft.), the Pointe de Charbonel (12,336 ft.), the Aiguille de la Grande Sassière (12,323 ft.), the Dent Parrachée (12,179 ft.), the Levanna (11,943 ft.) and the Aiguilles d'Arves (11,529 ft.). A small portion of the department (including both shores of the Lac du Bourget) is in the part of the duchy of Savoy neutralized in 1815. The chief products are cattle and dairy-products and wine. There are general manufactures and tobacco is grown. It is divided into 3 arrondissements (Chambéry, the chief town, Albertville and St. Jean de Maurienne), 29 cantons and 330 communes. It forms the dioceses of Chambéry (an archbishopric), Moutiers-Tarentaise, St. Jean de Maurienne and Annecy, it is in the XIVth military region (Lyons), and is in the *académie* (educational division) of Chambéry, where is its court of appeal. There are mineral springs at Aix-les-Bains (q.v.), while other sulphur springs rise at Marliez

and at Challes, those of Salins being saline, and those of Brides (the best known after Aix) alkaline. For the history of the district see SAVOY, HOUSE OF.

See J. J. Vernier, *Dictionnaire topographique du département de la Savoie* (Chambéry 1897).

SAVONA, a seaport and episcopal see of Liguria, Italy, the capital of the province of Savona, 27 mi. W.S.W. of Genoa by rail, 33 ft. above sea level, and after Genoa and Nice the most important city of the Riviera. Pop. (1936) 57,354, town; 64,199, commune. The greater part of the town is now modern with wide streets with porticoes. It is surrounded with green-clad hills and luxuriant orange groves. Near the shore stands the castle built by the Genoese in 1542, on the area of the old cathedral, and now occupied by large ironworks. The cathedral (1589–1604) is a late Renaissance building with a 12th century font, fine choir-stalls and pulpit (1500). In the Cappella Sistina, to the north, stands the finely carved tomb erected by Sixtus IV to his parents. Facing the cathedral is the Della Rovere palace erected by Cardinal Giulio della Rovere (Julius II) from the plans of Giuliano da Sangallo, now occupied by various public buildings, the prefecture, the post-office and law-courts. The municipal picture gallery is interesting, and there are some fine old buildings in the town. Good majolica was made in the 16th, 17th and 18th centuries. The Teatro Chiabrera was erected in 1853 in honour of the lyric poet Chiabrera (1552–1637). The harbour, dating from 1815, has since 1880 been provided with a dock excavated in the rock, 986 ft. long, 460 ft. wide and 23 ft. deep. Savona is one of the chief seats of the Italian iron industry, having ironworks and foundries, shipbuilding, railway workshops, a railway signal factory, engineering shops, brass foundry, tinplate works, sulphur mills and glassworks. In 1934–36 an average of 4,014 vessels of 4,279,943 tons entered and cleared the port yearly. Most of the goods were imports, almost entirely foreign coal and petrol. The coal imported at Savona is dealt with by an extensive telpherage system. There is a railway through the mountains from Savona to Turin (91 mi. N.N.W.). The city was bombed by the Allies during World War II.

Savona is the ancient *Savo*, a town of the Ingaeuni (see ALBENGA), but less important than Vada Sabatia (Vado), 4 mi. to the W., up to which the coast road from Rome was reconstructed in 109 B.C., from which a road diverged across the Apennines to Placentia. In 1191 Savona bought up the territorial claims of the marquesses Del Carretto. Its whole history is that of a long struggle against the preponderance of Genoa. As early as the 12th century the Savonese built themselves a sufficient harbour; but in the 16th century the Genoese, fearing that Francis I of France intended to make it a great seat of Mediterranean trade, rendered it useless by sinking at its mouth vessels filled with large stones.

SAVONAROLA, GIROLAMO (1452–1498), Italian monk and reformer, born at Ferrara on Sept. 21, 1452, was the third child of Michele Savonarola and his wife Elena Bonaccossi of Mantua. Elena was tenderly loved by her famous son, and his letters prove that she retained his fullest confidence through all the vicissitudes of his career. Girolamo was intended for the medical profession, but even as a boy he had intense pleasure in reading St. Thomas Aquinas and the Arab commentators of Aristotle, was skilled in the subtleties of the schools, wrote verses and studied music and design. To the mystic young student all festivities were repulsive, and although reared in a courtier-household he early asserted his individuality by his contempt for court life. At the age of 19 he was passionately in love with the daughter of a neighbour, a Strozzi exiled from Florence, but his suit was repulsed with disdain and this probably decided his career. He was full of doubt and self-distrust, but in 1474 his doubts were dispelled by a sermon heard at Faenza and he entered the monastery of St. Domenico at Bologna, where his novitiate was marked by a fervour of humility. He passed six quiet years in the convent, but his poems written during that period are expressive of burning indignation against the corruptions of the church.

In 1482 he reluctantly accepted a mission to Ferrara, and later he was sent to the convent of St. Mark in Florence. In 1483 he was Lenten preacher in the church of St. Lorenzo, but his plain,

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earnest exhortations attracted few hearers. His first success as a preacher was gained at San Gimignano (1484-85), but it was only at Brescia in the following year that his power as an orator was fully revealed. In a sermon on the Apocalypse he shook men's souls by his terrible threats of the wrath to come, and drew tears from their eyes by the tender pathos of his assurances of divine mercy. Soon, at a Dominican council at Reggio, Savonarola had occasion to display his theological learning and subtlety. The famous Pico della Mirandola was particularly impressed by the friar's attainments, and is said to have urged Lorenzo de' Medici to recall him from Lombardy. When Savonarola returned to Florence in 1490, his fame as an orator had gone there before him, and on Aug. 1, 1490, he first preached in the church of St. Mark.

Prior of St. Mark's.—In 1491 he was invited to preach in the cathedral, and his rule over Florence may be said to begin from that date. Lorenzo sent leading citizens to him to urge him to show more respect to the head of the state. Savonarola rejected their advice and foretold the impending deaths of Lorenzo, of the pope and of the king of Naples. In the July of the same year he was elected prior of St. Mark's. As the convent had been rebuilt by Cosimo, and enriched by the bounty of the Medici, it was considered the duty of the new superior to present his homage to Lorenzo. Savonarola, however, refused to conform to the usage. His election was due to God, not Lorenzo. In April 1492, Lorenzo de' Medici was on his death-bed at Careggi. Oppressed by the weight of his sins, he summoned the unyielding prior to shrive his soul. Savonarola reluctantly came and offered absolution upon three conditions. Lorenzo asked in what they consisted. First, "You must repent and feel true faith in God's mercy." Lorenzo assented. Secondly, "You must give up your ill-gotten wealth." This, too, Lorenzo promised, after some hesitation; but upon hearing the third clause, "You must restore the liberties of Florence," Lorenzo turned his face to the wall and made no reply. Savonarola waited a few moments and then went away. And shortly after Lorenzo died unabsolved.

Savonarola's influence now rapidly increased. The same year Innocent VIII. died (July 1492) and men's minds were full of anxiety, an anxiety increased by the scandalous election of Cardinal Borgia to the papal chair. During the delivery of one of his Advent sermons, Savonarola beheld the vision, recorded in contemporary medals and engravings, that is almost a symbol of his doctrine. A hand appeared to him bearing a flaming sword inscribed with the words: "Gladius Domini supra terram cito et velociter." He heard supernatural voices proclaiming mercy to the faithful, vengeance on the guilty, and mighty cries that the wrath of God was at hand. Then the sword bent towards the earth, the sky darkened, thunder pealed, lightning flashed, and the whole world was wasted by famine, bloodshed and pestilence. He was presently addressing enthusiastic congregations at Prato and Bologna whence he returned to Florence. He was rapturously welcomed by the community of St. Mark's, and at once proceeded to re-establish the discipline of the order. For this purpose he obtained, after much difficulty, a papal brief emancipating the Dominicans of St. Mark from the rule of the Lombard vicars of that order. He thus became an independent authority, no longer at the command of distant superiors. He relegated many of the brethren to a quieter retreat outside the city, only retaining in Florence those best fitted to aid in intellectual labour. Meanwhile he thundered forth predictions of heavenly wrath. In 1494 the duke of Milan demanded the aid of France, and King Charles VIII. brought an army across the Alps. The incompetent policy of Piero de' Medici, Lorenzo's successor, towards Charles drove Florence to revolt. But even at this crisis Savonarola's influence was all-powerful, and a bloodless revolution was effected. The resuscitated republic sent a fresh embassy to the French king, to arrange the terms of his reception in Florence. Savonarola was one of the envoys, Charles being known to entertain the greatest veneration for the friar who had so long predicted his coming and declared it to be divinely ordained. Charles entered Florence on Nov. 17, 1494, but the exorbitance of his demands soon showed that he came as a foe. The signory resolved to be rid of their dangerous guest; and, when Charles threatened to sound his

trumpets unless the sums exacted were paid, Capponi tore up the treaty in his face and made the memorable reply: "Then we will ring our bells." The monarch, alarmed at the dangerous possibilities of fighting in the narrow streets of the city, accepted moderate terms, and, yielding to Savonarola's remonstrances, left Florence on Nov. 24.

The citizens turned to the patriot monk whose words had freed them of King Charles, and Savonarola became the law-giver of Florence. The first thing done at his instance was to relieve the starving populace within and without the walls; shops were opened to give work to the unemployed; all taxes, especially those weighing on the lower classes, were reduced; the strictest administration of justice was enforced, and all men were exhorted to place their trust in the Lord. And, after much debate as to the constitution of the new republic, Savonarola's influence carried the day in favour of Soderini's proposal of a universal or general government, with a great council on the Venetian plan. Savonarola's programme of the new government was comprised in the following formula: (1) fear of God and purification of manners; (2) promotion of the public welfare in preference to private interests; (3) a general amnesty to political offenders; (4) a council on the Venetian model, but with no doge. At first the new machinery acted well; the public mind was tranquil.

Dictator of Florence.—Without holding any official post in the commonwealth he had created, the prior of St. Mark's was the dictator of Florence, and guarded the public weal with extraordinary political wisdom. At his instance the tyrannical system of arbitrary imposts and so-called voluntary loans was abolished, and replaced by a tax of 10% (*la decima*) on all real property. His counsels were always given as addenda to the religious exhortations in which he denounced the sins of his country and the pollution of the church, and urged Florence to cast off iniquity and become a truly Christian city, a pattern not only to Rome but to the world at large. His eloquence was now at the flood. Pleasure-loving Florence was completely changed. Abjuring pomps and vanities, its citizens observed the ascetic régime of the cloister. Hymns and psalms rang in the streets that had so recently echoed with Lorenzo's dissolute songs. Both sexes dressed with Puritan plainness; husbands and wives quitted their homes for convents and persons of all ranks—nobles, scholars and artists—renounced the world to assume the Dominican robe. Still more wonderful was Savonarola's influence over children, and their response to his appeals is a proof of the magnetic power of his goodness and purity. He organized the boys of Florence in a species of sacred militia and it was with the aid of these youthful enthusiasts that Savonarola arranged the religious carnival of 1496, when the citizens gave their costliest possessions in alms to the poor, and tonsured monks, crowned with flowers, sang hymns and performed wild dances for the glory of God. In the same spirit, and to point the doctrine of renunciation of worldly enjoyments, he celebrated the carnival of 1497 by the famous "burning of the vanities" (i.e. masks and other objects pertaining to the carnival festivities, indecent books and pictures, etc.) in the Piazza della Signoria. Nevertheless the artistic value of the objects consumed has been greatly exaggerated by some writers. Savonarola was foes neither to art nor to learning. On the contrary, so great was his respect for both that, when there was a question of selling the Medici library to pay that family's debts he saved the collection at the expense of the convent purse.

Conflict with the Pope.—Meanwhile his uncompromising spirit roused the hatred of political adversaries as well as of the degraded court of Rome. Even now, when his authority was at its highest, when his fame filled the land, and the vast cathedral and its precincts lacked space for the crowds flocking to hear him, his enemies were secretly preparing his downfall. Events were taking a turn hostile to the prior and Alexander VI., having seen a transcript of one of Savonarola's denunciations of his crimes, resolved to silence this daring preacher.

Bribery was the first weapon employed, and a cardinal's hat was held out as a bait. But Savonarola indignantly spurned the offer. So long as King Charles remained in Italy Alexander's concern for his own safety prevented vigorous measures against the

friar, but no Borgia ever forgave an enemy. He bided his time and in July 1495, a papal brief courteously summoned Savonarola to Rome. In terms of equal courtesy the prior declined the invitation, nor did he obey a second less softly worded, in September. Then came a third, threatening Florence with an interdict in case of renewed refusal. Savonarola disregarded the command, but went to preach for a while in other Tuscan cities. But in Lent his celebrated sermons upon Amos were delivered in the Duomo, and again he urged the necessity of reforming the church, striving by ingenious arguments to reconcile rebellion against Alexander with unalterable fidelity to the Holy See. Alexander now issued a brief, uniting St. Mark's to a new Tuscan branch of the Dominicans, thus depriving Savonarola of his independent power, while Piero de' Medici's followers continued their intrigues, and party spirit increased in virulence. The citizens were growing weary of the monastic austerities imposed on them, and Alexander foresaw that his revenge was at hand.

A signory openly hostile to Savonarola took office in May, and, in feigned anxiety for the public peace, besought him to suspend his discourses. Shortly afterwards the threatened bull of excommunication was launched against him, and Fra Mariano was in Rome stimulating the pope's wrath. Savonarola remained undaunted. The sentence was null and void, he said. His mission was divinely inspired; and Alexander, elected simoniacally and laden with crimes, was no true pope. Nevertheless the reading of the bull in the Duomo with the appropriate, terrifying ceremonial, made a deep impression on the Florentines. But in July Savonarola's friends were again in power and did their best to have his excommunication removed. During this time Rome was horror-struck by the mysterious murder of the young duke of Gandia, and the bereaved pope mourned his son with the wildest grief. Savonarola wrote him a letter of condolence, boldly urging him to bow to the will of Heaven and repent while there was yet time.

Florence then was plunged in new troubles through Medicean intrigues, and a conspiracy for the restoration of Piero was discovered and resulted in the execution of five leading citizens including Bernardo del Nero, a very aged man of lofty talents and position. It is said that at least Bernardo del Nero would have been spared had Savonarola raised his voice, but the prior would not ask mercy for them. This silence proved fatal to his popularity with moderate men. He was now interdicted from preaching even in his own convent and again summoned to Rome. As before, the mandate was disobeyed. He refrained from public preaching, but held conferences in St. Mark's with large gatherings of his disciples, and defied the interdict on Christmas Day by publicly celebrating mass and heading a procession through the cloisters. In 1498 the Piagnoni, as Savonarola's followers were called, were again at the head of the state, and at their request the prior resumed his sermons in the Duomo, while his dearest disciple, Fra Domenico Buonvicini, filled the pulpit of St. Lorenzo. For the last time the carnival was again kept with strange religious festivities, and some valuable books and works of art were sacrificed in a second bonfire of "vanities." But menacing briefs poured in from Rome, the city itself was threatened with interdict, and the Florentine ambassador could barely obtain a short delay. Now, too, the Piagnoni quitted office; the new signory was less friendly, and the prior was persuaded by his adherents to retire to St. Mark's. Alexander now demanded that the Florentines should silence the man themselves or send him to be judged by a Roman tribunal. Savonarola now despatched letters to the rulers of Europe adjuring them to assemble a council to condemn this antipope. But the papal threats were now urgent, and the signory entreated Savonarola to cease preaching. He obeyed, and concluded his last discourse with the most touching farewell.

The government hoped that Alexander would be appeased and Florence allowed to breathe freely. But although silenced, the prophet was doomed. A creature of the Arrabbiati, a Franciscan friar named Francesco di Puglia, challenged Savonarola to prove the truth of his doctrines by the ordeal of fire. At first the prior treated the provocation with merited contempt, but his too zealous disciple Fra Domenico accepted the challenge and, when the Franciscan declared that he would enter the fire with Savonarola

alone, Fra Domenico protested his willingness to enter it with any one in defence of his master's cause. As Savonarola resolutely declined the trial, the Franciscan deputed a convert, one Giuliano dei Rondinelli, to go through the ordeal with Fra Domenico. Savonarola, perceiving that a trap was being laid for him, disconcerted the "experiment" until his calmer judgment was at last overborne by the fanaticism of his followers. On April 7, 1498, an immense throng gathered in the Piazza della Signoria to enjoy the barbarous sight. The Dominicans, led by Savonarola, and the Franciscans came forward, but neither Rondinelli nor Fra Francesco appeared and there were angry disputes between the two groups of friars. It was now late in the day, and a storm shower gave the authorities a pretext for declaring that heaven was against the ordeal. The Franciscans slipped away unobserved, but Savonarola raising the host attempted to lead his monks across the piazza in solemn order as before. On this the popular fury burst forth. Defrauded of their cruel diversion, the people were wild with rage. Fra Girolamo's power was suddenly at an end. Against the real culprits, the Franciscans, no anger was felt; the zealous prior, the prophet and lawgiver of Florence, was made the popular scapegoat. Notwithstanding the anguish that must have filled his heart, the fallen man preserved his dignity and calm. Mounting his own pulpit in St. Mark's he quietly related the events of the day to the faithful assembled in the church, and then withdrew to his cell, while the mob outside clamoured for his blood.

Arrest and Trial.—The next morning the government decided on his arrest, and no sooner was this made public than the populace rushed to the attack of the convent. The monks and their few remaining friends made a most desperate defence. In vain Savonarola besought them to lay down their arms. When the church was finally stormed Savonarola was seen praying at the altar, with Fra Domenico, armed with an enormous candlestick, guarding him from the blows of the mob. A few disciples dragged their beloved master to the inner library and urged him to escape, when a cowardly monk, one Malatesta Sacramoro, cried out that the shepherd should lay down his life for his flock. Thereupon Savonarola turned, bade farewell to the brethren, and, accompanied by the faithful Domenico, quietly surrendered to his enemies. The prisoners were conveyed to the Palazzo Vecchio.

Now came an exultant brief from the pope. His well-beloved Florentines were true sons of the church, but must crown their good deeds by despatching the criminals to Rome. The signory refused to send their prisoners to Rome but they did Rome's behests. Day after day Savonarola was tortured, and in his agony, with a frame weakened by constant austerity and the mental strain of the past months, he made every admission demanded by his tormentors. But directly he was released from the rack he always withdrew the confessions uttered in the delirium of pain. These being too incoherent to serve for a legal report, a false account of the friar's avowals was drawn up and published. Alexander was frantically eager to see his enemy die in Rome. But the signory insisted that the false prophet should suffer death before the Florentines whom he had so long led astray. The matter was finally compromised. A second mock trial was held by two apostolic commissioners specially appointed by the pope. Meanwhile the trial of Brothers Domenico and Silvestro was still in progress. The former remained faithful to his master and himself. No extremity of torture could make him recant or extract a syllable to Savonarola's hurt; he steadfastly repeated his belief in the divinity of the prior's mission. Fra Silvestro on the contrary gave way at mere sight of the rack, and owned himself and his master guilty of every crime laid to their charge.

The two commissioners soon ended their task. They had the pope's orders that Savonarola was to die "even were he a second John the Baptist." On three successive days they "examined" the prior with worse tortures than before. On May 22 sentence of death was pronounced on him and his two disciples. Savonarola listened unmoved to the awful words and then quietly resumed his interrupted devotions. Fra Domenico exulted in the thought of dying by his master's side, Fra Silvestro, on the contrary, raved with despair. The only favour Savonarola craved before death was a short interview with his fellow victims. This

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the signory unwillingly granted. The memorable meeting took place in the hall of the Cinquecento. During their 40 days of confinement and torture each one had been told that the other had recanted, and the false report of Savonarola's confession had been shown to the two monks. The three were now face to face for the first time. Fra Domenico's loyalty had never wavered, and the weak Silvestro's enthusiasm rekindled at sight of his chief. Savonarola prayed with the two men, gave them his blessing, and exhorted them by the memory of their Saviour's crucifixion to submit meekly to their fate. The following morning he prophesied that dire calamities would befall Florence during the reign of a pope named Clement. The carefully recorded prediction was verified by the siege of 1529.

The execution took place the same morning. First came the ceremonial of degradation. Sacerdotal robes were thrown over the victims, and then roughly stripped off by two Dominicans, the bishop of Vasona and the prior of Sta. Maria Novella. To the bishop's formula, "I separate thee from the church militant and from the church triumphant," Savonarola replied: "That is beyond thy powers." His disciples' bodies already dangled from the arms of the cross before he was hung on the centre beam. Then the pile was fired. At dusk the martyrs' remains were thrown into the Arno.

Every year on the anniversary of Savonarola's martyrdom flowers are strewn on the spot where it took place.

Savonarola's writings may be classed in three categories:—(1) numerous sermons, collected mainly by Lorenzo Violi, one of his most enthusiastic hearers; (2) an immense number of devotional and moral essays and some theological works, of which *Il Trionfo della Croce* is the chief; (3) a few short poems and a political treatise on the government of Florence. Although his faith in the dogmas of the Roman Catholic Church never swerved, his strenuous protests against papal corruptions, his reliance on the Bible as his surest guide, and his intense moral earnestness undoubtedly connect Savonarola with the movement that heralded the Reformation.

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(P. V.; L. V.)

SAVOY, HOUSE OF, a dynasty which ruled over the territory of Savoy and Piedmont for nine centuries, and since 1860 over the kingdom of Italy. The name of Savoy (Sabaudia) was known to the Romans during the decline of the empire. In the 5th century the territory was conquered by the Burgundians, and formed part of their kingdom; nearly a hundred years later it was occupied by the Franks. It was included in Charlemagne's empire and was divided by him into counties, which evolved there, as elsewhere, into hereditary fiefs; but after the break-up of Charlemagne's empire, the Burgundian kingdom revived and Savoy was again absorbed in it. After the collapse of that monarchy its territories passed to the German kings, and Savoy was divided between the counts of Provence, of Albon, of Gex, of Bresse, of the Genevois, of Maurienne, the lords of Habsburg, of Zähringen, etc., and several prelates.

Early Counts.—The founder of the house of Savoy was Umberto Biancamano (Humbert the White-handed), a feudal

lord, who in 1003 was count of Salmourenç in the Viennois, in 1017 of Nyon on the Lake of Geneva, and in 1024 of the Val d'Aosta on the eastern slope of the Western Alps. In 1034 he obtained part of Maurienne as a reward for helping King Conrad the Salic to make good his claims on Burgundy. He also obtained the counties of Savoy, Belley, part of the Tarantaise, and the Chablais. With these territories Umberto commanded three of the great Alpine passes, viz., the Mont Cenis and the two St. Bernards. His son Oddone married Adelaide, eldest daughter and heiress of Oderico Manfredi, marquess of Susa, a descendant of Arduino of Ivrea, king of Italy, who ruled over the counties of Turin, Auriate, Asti, Bredulo, Vercelli, etc., corresponding roughly to modern Piedmont and part of Liguria (1045). Umberto died some time after 1056 and was succeeded by his son, Amadeus I., at whose death the country passed to Oddone. Oddone ruled over territories on both sides of the Alps. He died in 1060, and was succeeded by his widow, Adelaide; but before her death in 1091 his son, Peter I., became count, and subsequently the latter's brother, Amadeus II. Under Humbert II. (1080) occurred the first clash with the Piedmontese communes, but he and his successors, Amadeus III. (who died on his way home from the crusades) and Thomas I. (1189), adopted a policy of conciliation towards them.

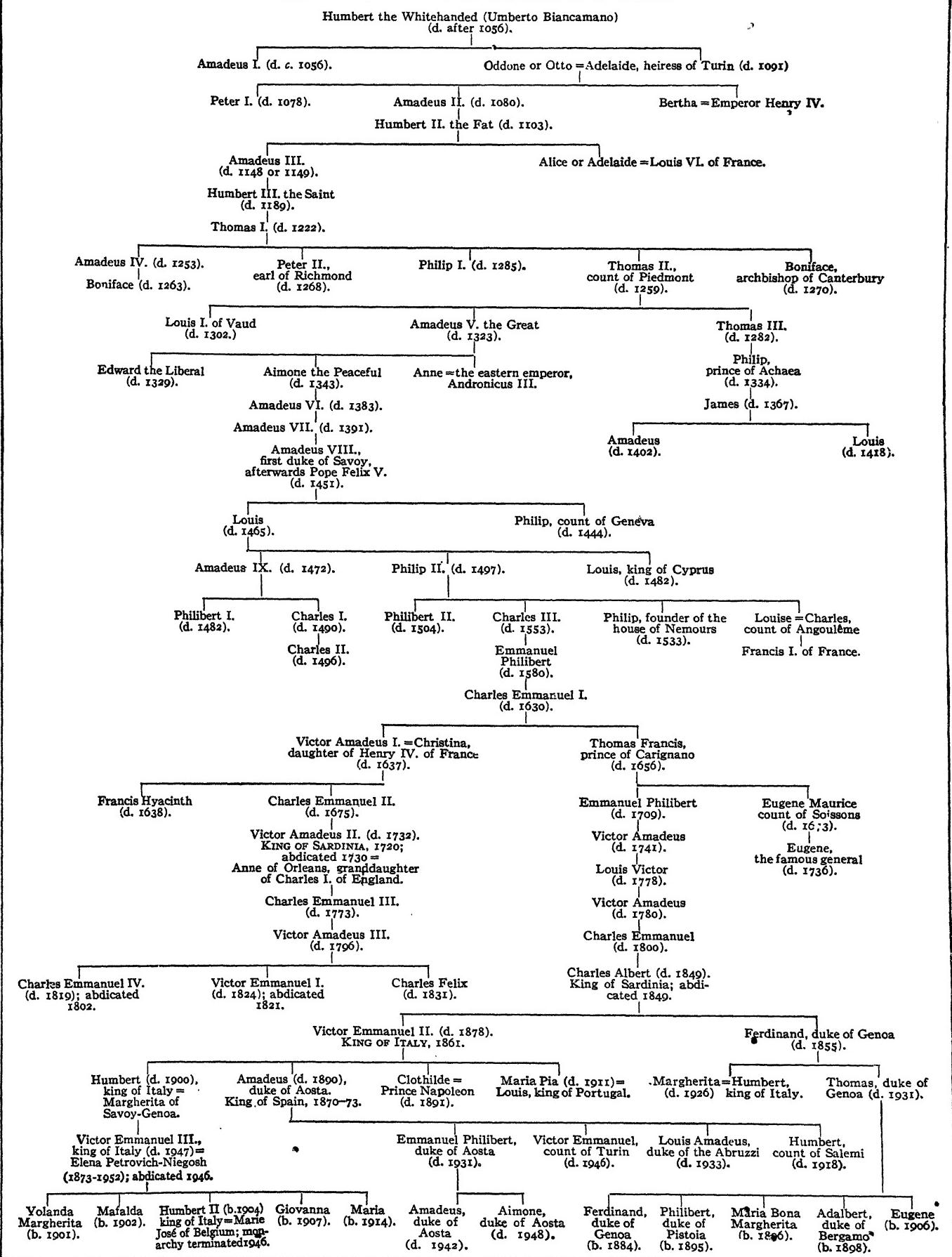
Thomas, who reigned until 1222, acquired extensions of territory in the Bugey, Vaud and Romont to the west of the Alps, and Carignano, Pinerolo, Moncalieri and Vigone to the east; he also exercised sway over Geneva, Albenga, Savona and Saluzzo. At his death these territories were divided among his sons, Thomas II. obtaining Piedmont, Aimone the Chablais, Peter and Philip other fiefs, and Amadeus IV., the eldest, Savoy and a general overlordship over his brothers' estates. Thomas II., during the wars in Piedmont, was made prisoner by the citizens of Turin, but was afterwards liberated.

Amadeus V. (1285–1323), son of Thomas II., reunited the county of Savoy (his own territory), the principality of Piedmont, ruled by his nephew Philip, prince of Achaea (a title acquired through his wife, Isabella of Villehardouin, heiress of Achaea and the Morea), and Vaud, ruled by his brother Louis. But although this division was formally recognized in 1295. Amadeus succeeded in enforcing his own supremacy over the whole country and in regaining by war, purchase or treaty, the fiefs lost by his predecessors. He fought against the dauphins of Viennois, the counts of Genevois, the people of Sion and Geneva, the marquesses of Saluzzo and Montferrat, and the barons of Faucigny, acted as peacemaker between France and England, accompanied the Emperor Henry VII. of Luxemburg on his expedition to Italy, reorganized the finances of the realm and reinforced the Salic law of succession. He was succeeded by his sons, Edward (1323–1329), known as "the Liberal," on account of his extravagance, and Aimone, the Peaceful (1329–1343), who strove to repair the harm done to the state's exchequer by his predecessor and proved one of the best princes of his line.

Amadeus VI. (1343–1383), son of Aimone, the Peaceful, and known as the *Conte Verde* or Green Count because of the costume he habitually wore at tournaments, succeeded at the age of nine. He won a reputation as a bold knight in the fields of chivalry and inaugurated a new policy by devoting more attention to his Italian possessions than to those on the French side of the Alps and in Switzerland. In 1366 he led an expedition to the East against the Turks; and he arbitrated between Milan and the house of Montferrat (1379), between the Scaligeri and the Visconti, and between Venice and Genoa after the "War of Chioggia" (1381). Amadeus was the first sovereign to introduce a system of gratuitous legal assistance for the poor. He espoused the cause of Louis, duke of Anjou, and while aiding that prince in his attempt to recover the kingdom of Naples he died of the plague, leaving his realm to his son, Amadeus VII., the *Conte Rosso* or "Red Count" (1383–1391); the latter added Nice (1388) and other territories to his domains.

Amadeus VIII. (1391–1451), count, extended his territories both in Savoy itself and in Italy, and in 1416 was created duke by the emperor Sigismund. In 1430 he promulgated a general

GENEALOGICAL TABLE OF THE HOUSE OF SAVOY.



statute of laws for the whole duchy, in spite of the opposition of the nobles and cities whose privileges were thereby curtailed. In 1434 he retired to the hermitage of Ripaille on the Lake of Geneva, but continued to conduct the chief affairs of the State and to mediate between foreign Powers, leaving matters of less importance to his son Louis. Five years later the council of Basel elected Amadeus pope, in spite of his not being a priest, and deposed Eugenius IV. Amadeus accepted the dignity, assuming the style of Felix V. In 1449 Amadeus abdicated and returned to his hermitage at Ripaille, where he died two years later.

15th Century.—Under Louis, Savoy began to decline, for he was indolent, incapable, and ruled by his wife, Anne of Lusignan, daughter of the king of Cyprus, who induced him to fit out an expedition to Cyprus, which brought him no advantage save the barren title of king of Cyprus, Jerusalem and Armenia. He went to France to seek aid of King Louis XI. against his nobles, and died there in 1465. In spite of his incapacity he acquired the city of Freilburg and the homage of the lords of Monaco. He was succeeded by his son, Amadeus IX. (1455–1472), who on account of ill-health left the duchy in the hands of his wife, Yolande, sister of Louis XI. During the minority of his son Philibert I. (1472–1482) Savoy lost Freiburg and many other territories. Philibert was succeeded by his brother Charles I. (1482–1490), who, freed by Louis XI. from the dangerous protection of Philip of Bresse and by death from that of the French king, crushed the rebellious nobles and seized Saluzzo (1487). He did much to raise the fortunes of his house, but died at the age of 31. Under his successors the duchy lost ground until the accession of Emmanuel Philibert in 1553.

Emmanuel Philibert.—At the time of his accession, Emmanuel Philibert was serving in the Spanish armies. Emmanuel could not take possession of the duchy at once, but continued to serve the emperor as governor-general of the Low Countries. By his victory at St. Quentin over the French in 1557 he proved himself one of the first generals of the day, and by the terms of the subsequent treaty of Cateau Cambrésis he was reinstated in most of his hereditary possessions (1559). Under Emmanuel Philibert Savoy lost all traces of constitutional government and became an absolute despotism of the type then predominating throughout the greater part of Europe. At the same time he raised his country from ruin and degradation into a prosperous and powerful monarchy.

Charles Emmanuel I.—His son and successor, Charles Emmanuel I. (q.v.), surnamed the Great, strengthened the tendency of Savoy to become less of a French and more of an Italian Power. In 1588 he wrested Saluzzo from the French, but his expeditions to Provence and Switzerland were unsuccessful. In the war between France and Spain after the accession of Henry IV., he took the Spanish side, and at the peace of Lyons (1601), although he gave up all his territories beyond the Rhone, his possession of Saluzzo was confirmed. His attempt to capture Geneva by treachery (1602) failed, and although on the death of Francesco Gonzaga, duke of Mantua and Montferrat, he seized the latter city (1612) he was forced by Spain and her allies to relinquish it. The Spaniards invaded the duchy, but after several years of hard fighting the peace of 1618 left his territory almost intact. In 1628 he sided with Spain against France; the armies of the latter overran the duchy, and Charles Emmanuel died in 1630. (See CHARLES EMMANUEL I.) His son, Victor Amadeus I. (1630–1675), succeeded to little more than a title, but by his alliance with France —his wife, Christina, being a daughter of Henry IV.—he managed to regain most of his territories. He proved a wise and popular ruler, and his early death was much deplored. He was succeeded by his second son, Charles Emmanuel II., who, being a minor, remained under the regency of his mother. That princess, in spite of her French origin, resisted the attempts of France, then dominated by Cardinal Richelieu, to govern Savoy, but her quarrels with her brothers-in-law led to civil war, in which the latter obtained the help of Spain, and Christina that of France. In the end the duchess succeeded in patching up these feuds and saving the dynasty, and in 1648 Charles Emmanuel II. assumed the govern-

ment. The war between France and Spain continued, and Savoy, on whose territory much of the fighting took place, suffered severely in consequence. By the treaty of the Pyrenees (1669) Savoy regained most of the towns occupied by France.

Victor Amadeus II.—Charles died in 1675 and was succeeded by his only son, Victor Amadeus II. (q.v.). The French king's arrogant treatment of Victor Amadeus spurred the latter to join the league of Austria, Spain and Venice against him in 1690. The campaign was carried on with varying success, but usually to the advantage of Louis, and the French victory at Marsiglia and the conduct of the allies induced Victor to come to terms with France (1696). By the treaty of Ryswick a general peace was concluded. In the War of the Spanish Succession (1700) Victor fought on the French side, until, dissatisfied with the continued insolence of Louis XIV. and of Philip of Spain, he went to the Austrians in 1704. The French invaded Piedmont, but were totally defeated at the siege of Turin by Victor Amadeus and Prince Eugene of Savoy (1706), and eventually driven from the country. By the treaty of Utrecht (1713) Victor received the long-coveted Montferrat and was made king of Sicily; but in 1718 the powers obliged him to exchange that kingdom for Sardinia, which conferred on the rulers of Savoy and Piedmont the title subsequently borne by them until they assumed that of kings of Italy. In 1730 he abdicated in favour of his son, Charles Emmanuel.

Charles Emmanuel III.—Charles Emmanuel III. (1730–1773), a born soldier, took part in the War of the Polish Succession on the side of France against Austria, and for his victory at Guastalla (1734) was awarded the duchy of Milan, which, however, he was forced to relinquish at the peace of Vienna (1736), retaining only Novara and Tortona. In the War of the Austrian Succession, which broke out on the death of the Emperor Charles VI., he took the side of Maria Theresa (1742). By the peace of Aix-la-Chapelle in 1748, following on the defeat of the French, Savoy gained some further accessions of territory in Piedmont. The reign of Charles's son, Victor Amadeus III. (1773–1796), was a period of decadence; the king was incapable and extravagant, and he chose equally incapable ministers. On the outbreak of the French Revolution he sided with the royalists and was eventually brought into conflict with the French republic. The army being demoralized and the treasury empty, the kingdom fell an easy prey to the republican forces. Savoy became a French province, and, although the Piedmontese troops resisted bravely for four years in the face of continual defeats, Victor at last gave up the struggle and signed the armistice of Cherasco. On his death in 1796, he was succeeded in turn by his three sons, Charles Emmanuel IV., Victor Emmanuel I. and Charles Felix.

Charles Emmanuel IV.—Charles Emmanuel (1796–1802), believing in Bonaparte's promises, was induced to enter into a confederation with France and give up the citadel of Turin to the French, which meant the end of his country's independence. Realizing his folly he abdicated on Dec. 6, 1798, and retired to Sardinia, while the French occupied the whole of Piedmont. After the defeat of the French by the Austro-Russian armies during Bonaparte's absence in Egypt, Charles Emmanuel landed at Leghorn, hoping to regain his kingdom; but Napoleon returned, and by his brilliant victory at Marengo he reaffirmed his position in Italy. The king retired to Naples, abdicated once more (1802), and entered the Society of Jesus; he died in Rome in 1819. Victor Emmanuel I. (1802–1820) remained in Sardinia until by the Final Act of the Congress of Vienna (June 9, 1815) his dominions were restored to him, with the addition of Genoa.

Italian Allegiance.—From this time the fortunes of the house of Savoy are bound up with those of Italy. (See ITALY: History.) Victor Emmanuel I. abdicated in 1821 in favour of his brother Charles Felix (1821–1831). The latter being without a son, the succession devolved upon Charles Albert, of the cadet line of the princes of Carignano, who were descended from Thomas, youngest son of Charles Emmanuel I. Charles Albert abdicated, on the evening of his defeat at Novara (April 20, 1849), in favour of his son Victor Emmanuel II. (1849–1878), who on Feb. 18, 1861, was proclaimed king of Italy. Victor

Emmanuel had married in 1842 Maria Adelaide, daughter of the archduke Rainer, who bore him several children, viz., Princess Clothilde (1843–1891), who married Prince Napoleon; Humbert (q.v.), who succeeded him; Amadeus, duke of Aosta (1845–1890); Oddone, duke of Montferrat (1846–1866); and Princess Maria Pia (1847–1911). Humbert was succeeded by his only son, Victor Emmanuel III (q.v.), who on May 9, 1946, abdicated in favour of his only son, Humbert II. On June 2, 1946, however, the Italian people voted to end the monarchy.

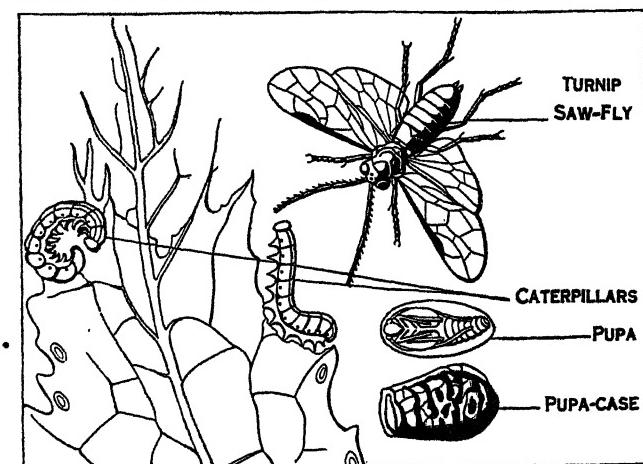
The second son of Victor Emmanuel II, Amadeus, duke of Aosta, was offered the crown of Spain by the Cortes in 1870, which he accepted, but, finding that his rule was not popular, he abdicated in 1873 rather than cause civil war. In 1867 he married Princess Maria Vittoria dal Pozzo della Cisterna, who bore him three sons, viz., Emmanuel Philibert, duke of Aosta (1869–1931), Victor Emmanuel, count of Turin, and Louis Amadeus, duke of the Abruzzi (1873–1933). The first wife of Amadeus, duke of Aosta, having died in 1876, he married Princess Maria Letizia Bonaparte in 1888, who bore him a son, Humbert, count of Salemi (1889–1918).

(L. V.)

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SAWANTWARI: see SAVANTWADI.

SAW-FLY, name given to members of the division Chalcogastra of the order Hymenoptera (q.v.), characterized by the broad base to the abdomen, where it joins the thorax, and by the wing-veins being less reduced than in other members of the order. Their name is derived from the fact that the lower or anterior blades of the ovipositor are toothed and saw-like. Their larvae are usually caterpillars and in most cases may be distinguished from those of moths and butterflies by having six or more pairs of abdominal feet and only a single pair of simple eyes or ocelli. When disturbed they roll themselves in a spiral fashion and some species discharge a thin fluid from glands above the spiracles. The females lay their eggs in incisions in plants, cut by the saw-like blades of the ovipositor, and the larvae are vegetable feeders. Species of several genera, notably *Pontania*, form galls on willows.



THE LIFE HISTORY OF THE TURNIP SAW-FLY (ATHALIA SPINARUM)

The cause of the gall is stated to be a secretion injected along with the egg, and it has been suggested that it contains an enzyme which acts upon the plant so as to induce gall-formation. Reproduction in saw-flies is of considerable interest: in many species males are unknown and parthenogenesis (q.v.) is the rule. In the gooseberry saw-fly the unfertilized eggs give rise only to males, while the fertilized eggs produce individuals of both sexes, females predominating.

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The true saw-flies belong to the large family *Tenthredinidae* and the larvae of many of these are injurious to plants. Thus, the gooseberry saw-fly, *Nematus ribesii*, is very destructive to that plant and to currants, while the pear slug, *Caliroa limacina*, attacks pears. These two species and also the larch saw-fly, *Lygaeonematus erichsonii*, have been accidentally imported from Europe into North America where they have likewise become destructive. Other harmful species in Europe are *Athalia spinarum*, the turnip saw-fly, and *Lophyrus pini*, which attacks plantations of Scotch firs. The best remedy is to shake off and destroy the young larvae from bushes, where practicable, or to spray with an arsenical wash. The small families *Cephidae* and *Siricidae* have larvae that are borers. The *Cephidae* make burrows, usually in stems; the best-known species is *Cephus pygmaeus*, which attacks wheat. It is destructive in North America, where *Janus integer*, the stem girdler of the currant, is also troublesome; but it seldom causes appreciable injury in Britain. The *Siricidae* bore into solid timber and are known as wood wasps or horntails. *Sirex gigas* is the most familiar European wood wasp and is not uncommon in Britain.

(A. D. I.)

SAWING MACHINES. The saw is one of the most valuable tools, and just as there are many varieties of hand-saws so there are many machines, suited for sawing wood, bone, fibre, stone, marble, slate and metals, and varying in size from little fret-sawing machines to the huge machines which part off steel ingots with a 12 ft. diameter circular saw.

There are three methods of action; the reciprocating blade, cutting one way or both ways, the continuously running blade or band-saw, and the circular saw. Some materials can be cut on any system without making any real difference to the results, but often it happens that one method proves better than another. The shape to be parted off or cut to outline may be difficult or impossible with one sort of blade and easy with another, while size makes a difference in some cases. Thin saws penetrate with less consumption of power, and are the choice if they will cut truly instead of deviating. Moreover, there is less waste of material in the form of dust, an important consideration in the more expensive substances. Yet if a thin saw wanders from a true line it may not be economical, by reason of the fact that the cut surface has to be trued up afterwards with more or less expenditure of time and labour. Wood cutting saws are dealt with under **WOOD-WORKING MACHINERY**.

Machines with Reciprocating Blades.—The smallest machines of this class are the *jig-saws*, equivalents of the fret-saws for wood. The work is held upon a horizontal table up through which the saw blade reciprocates, with a stroke variable from zero to three or four inches in the smallest sizes. Dies, metal patterns and templates of intricate outline are sawn out of sheets or blocks. The reciprocation is produced by a belt pulley driving a crank-disc and connecting-rod. Some machines have holders which will grip a file instead of a saw so as to finish outlines smoothly after sawing, and an oil-stone stick or lap may also be used for truing up hardened dies.

A larger type of machine is the power hack-saw, which has a horizontal frame to strain the blade in like a hand hack-saw; it reciprocates the blade with crank and rod over a vice in which the bar or girder to be sawn is clamped. The weight of the frame is sufficient to feed the blade through, and a safety arrangement takes care of the possibility of the blade snapping as it breaks through the bar. Multiple-blade machines cut off a number of discs or slabs simultaneously, and rather big machines are now made for girder sawing. Portable machines are used for sawing tram and railway rails and girders. The hack-saw is a cheap and handy machine for any class of workshop, large or small, and the blades are cheap and quickly replaced. Until recently they were thrown away when worn too dull for efficient cutting, but now tungsten blades of fast cutting capacity can be sharpened many times.

Band-Sawing Machines.—Wide cuts are taken in wood with reciprocating saws that deal with logs, and stone-sawing machines are also built on the same principle, a long table carrying the wood or stone along under the blade, but this is

not suitable for thick metal-cutting. The band-saws cut faster, with better guidance, and the dust is carried away more effectually. These machines are either vertical or horizontal. In the former design the metal is clamped to a horizontal table and the blade runs over a top pulley and down through the work and table to the lower pulley. Straight or curved cuts are controlled by the movements of the table by handles and screws operating slides. Though small machines are occasionally used instead of the jig-saws, most band-saws are of fairly large dimensions, with pulleys from 3 ft. to about 6 ft. in diameter, the latter size admitting slabs or forgings of nearly 6 ft. in depth. The pulleys are covered with rubber tyres to give the grip to the saw, and in cutting iron and steel a soapy water solution has to be pumped on to the blade. This is run through a guide immediately above the surface of the work to assist in true cutting. Horizontal band-saws of large dimensions deal with forgings, fed along by a table as in a planing-machine, and are also very convenient for trimming off the uneven edges of flanged plates, for boiler construction, enabling the caulking to be done properly after riveting together.

Circular Sawing Machines.—These comprise a large group, from little ones to saw bone, fibre, aluminium, brass and copper, to the more powerful types that cut iron and steel. The speeds of rotation of the saws for the soft materials are high, and the feeding can often be effected by hand instead of by slides or levers such as are necessary in steel and iron sawing. Sometimes it is the saw that is fed along by a slide, sometimes the work on a slide instead. The machines which cut girders have a special yielding motion to the feed device: this causes the saw to feed more slowly through the thick sections than through the thin webs, which can naturally be penetrated at a faster rate. The saw is clamped on a spindle with nut and washer for ordinary cutting, but the *flush-side* machines have the saw attached with sunken bolts, so that one side of it is perfectly flat. This provision is essential for iron and steel foundries, to part off the superfluous runners or gates (which feed the molten metal into the mould) flush with the surface.

Ordinary saw blades are formed with the teeth cut in the same disc, but the larger blades, especially for steel forging sawing, have inserted teeth, each held in with a wedge and screw fastening, so that any breakages can be made good cheaply and quickly. The largest blades cut armour-plate and ingots, also pieces out of big crankshaft forgings to form the webs. Duplex blades, running side by side at the appropriate distance apart halve the time of cutting out such slabs.

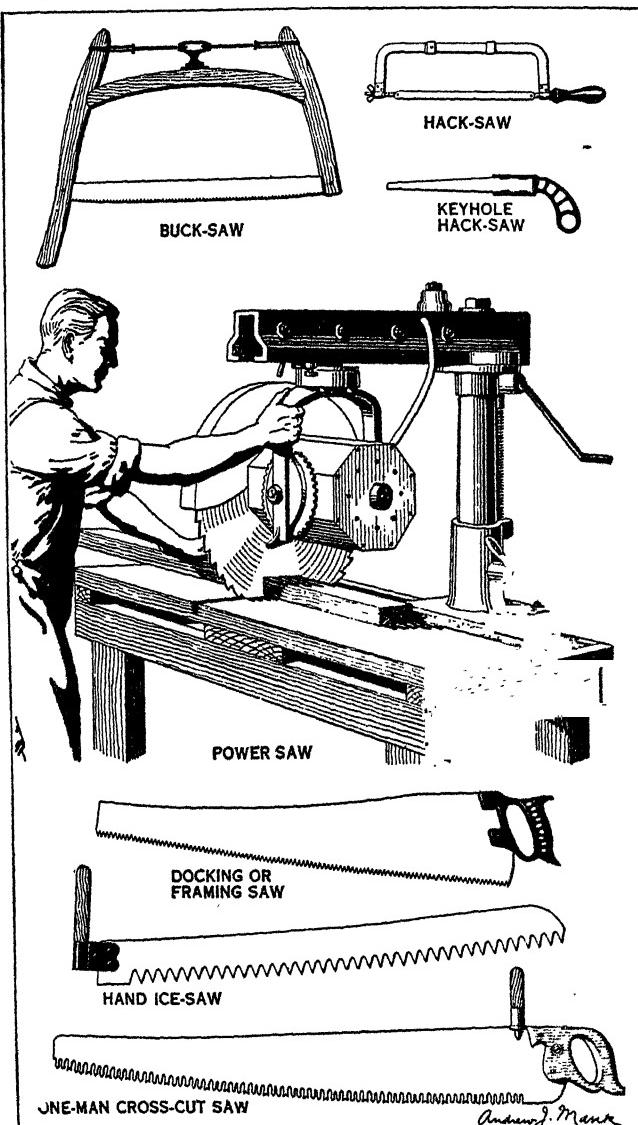
In the iron and steel works hot metal during forging or rolling operations is parted by a special sort of machine, the *hot saw*, that cuts at a fast rate. The large machines act on the pendulum principle, the blade being run in bearings at the bottom end of a deep swing frame which is pushed across by hydraulic or pneumatic cylinder to pass the saw through the hot metal, resting on a slide-way beneath. The speed of revolution is high, and large horse-power is consumed.

Friction Sawing Machines.—These are peculiar inasmuch as the circular blade has no cutting teeth, but is driven at so high a speed that the friction generates such heat in the immediate vicinity that the metal is burned through. For instance a railway rail of 90 lb. per yard can be parted off in 7 seconds, or a channel section of 12 in. by 6 in. with $\frac{3}{4}$ in. thick metal in 14 seconds, leaving a clean smooth finish. Some assistance is given to the action if the blade is very slightly notched around the periphery, though not like the true teeth of a saw. (F. H.)

SAW-MILL, strictly, a mill in which logs are "broken down" into balks, deals, fitches, battens, planks and boards for sale or further treatment. But often the word is applied to a mill the plant of which includes planing, moulding, tenoning and other machines for finishing processes. The biggest mills are usually situated near a timber supply, brought by river or rail, and the design of the mill is in some degree affected by the mode of transit. More space is necessary for storage in the rail-borne example. In the water-borne system the logs float right into the mill and are dragged out in turn by a winch. An overhead crane serves the

stock-yard in the rail system, and carries the logs on to the machines.

The cutting is performed on various kinds of big machines, a preliminary operation often being that of cross-cutting to obtain convenient lengths. Cutting up into the various thicknesses is done by either reciprocating or band-saws, or circular saws, the log being held with dogs on a table which feeds it past the saw. Some band-sawing machines are of horizontal design, some vertical, the latter taking up less floor-space. The log-frame is a machine with a set of vertically reciprocating blades, suitably spaced apart, and it divides a log into boards at one pass of the table. The number of blades may be few, not exceeding four in some cases for cutting thick pieces, or as many as fifty for thin boards. Re-sawing machines are those for further dealing with material partly broken up, such as fitches and deals. The great quantity of sawdust and chips from the machines is neatly disposed of by pneumatic ducts ending in the boiler house, on the system mentioned in FANS.



POWER SAW BY COURTESY OF THE DE WALT PRODUCTS CO.; OTHERS BY COURTESY OF THE SIMONDS SAW AND STEEL CO.

TYPES OF SAWS WITH A MOTOR-DRIVEN WOODWORKER SAW IN THE CENTRE

SAWS, cutting-tools with toothed edges. The various types of saw may be classified into reciprocating, revolving, and travelling, i.e., band-saws passing around wheels. The first class includes numerous hand- and machine-operated blades, some cutting only on the one stroke, others cutting both backwards and forwards. The second class covers the circular saws for wood,

bone, ivory and metal; the largest of the third class are made up to about 12 ft. in diameter. Large band-saws are used for cutting up big forgings into various outlines. Some saws have the teeth milled or punched out of the solid plate or web; others have teeth fastened in with wedges, so that they are easily replaced in case of fracture, besides being easier to make and temper. What are termed *friction saws* have either no teeth or but slight notches on the periphery, and they will cut through iron and steel owing to the heat generated by the friction at the great speed of rotation. Diamond saws have a large number of diamonds fixed in pockets on the rim and are employed for stone sawing. The principal difficulties with saws are clearance in the "kerf," which depends on the "set" or side projection of the teeth beyond the web or plate of the saw; and true cutting, which depends partly on guidance and partly on the truth of the blade. Circular saws for wood are hammered to make a "tension," so that although the saw does not lie true while at rest, its rim runs perfectly true at the appropriate speed for which it has been tensioned.

Saws date from Neolithic times, when they were formed from flint flakes with finely jagged edges; they were followed by metal saws made in bronze or copper. Now steel is employed exclusively, some for sawing wood being tempered soft enough to be sharpened with a file, while those for cutting metal can only be sharpened with a grinding wheel. The fineness or coarseness of teeth varies greatly, according to the class of sawing. So do the shapes of teeth, some pointing forward with straight or curved edges, others of equal angles and many of special M shapes for heavy cross-cutting of lumber. The most elaborate teeth have "cleaner" teeth interspaced so as to scrape out the sawdust and clean the kerf neatly. In the larger circular saws the inserted class of teeth is very common. These are held in pockets around the disc with a V fastening and a springy holder, or with a wedge fixing. (See WOOD-WORKING MACHINERY; MACHINE-TOOLS.)

SAWTREY, WILLIAM (d. 1401), English Lollard, was a priest at Lynn who was summoned before the bishop of Norwich for heresy in 1399. He was the first Lollard martyr, being burned at St. Paul's Cross in March 1401.

SAX, ANTOINE JOSEPH, known as ADOLPHE (1814-1894), maker of musical instruments, was born at Dinant in Belgium on Nov. 6, 1814, and died in Paris in 1894. In 1835 he perfected a bass clarinet superior to any that had preceded it. He went to Paris in 1842, and set up a workshop in the Rue St. Georges. Sax discovered a new principle in the manufacture of wind instruments, viz., that it is the proportions given to a column of air vibrating in a sonorous tube, and these alone, that determine the character of the timbre produced: the material of the walls of the tube is not of the slightest importance so long as it offers enough resistance. In 1845 he patented his saxhorn and a family of cylinder instruments called saxotrombas. On June 22, 1846 he registered the saxophone. He also effected various improvements in piston instruments, of which the most important was the substitution of a single ascending piston for a number of descending ones.

See J. P. O. Cornettant, *Histoire d'un inventeur* (1860); C. Pilard, *Les Inventions Sax* (1869).

* **SAXA RUBRA**, also called AD RUBRAS (*rupes, i.e., the red tufa cliffs*) a post-station on the ancient Via Flaminia, 9m. north of Rome. The modern hamlet of Prima Porta takes its name from the remains of a brick arch, perhaps of Constantine period. It was the site of the defeat of Maxentius by Constantine in A.D. 312 in the decisive battle which sealed the triumph of Christianity (see CONSTANTINE I.). This is often known as the battle of the Milvian bridge, from the fact that Maxentius and many of his routed troops were drowned there. That Constantine's headquarters were at Malborghetto has been proved by Toebeleman.

See F. Toebeleman, *Der Bogen von Malborghetto* (Heidelberg, Akademie der Wissenschaften, Abhandlung, philosophisch-historische Klasse, 1915); T. Ashby and R. A. L. Fell in *Journal of Roman Studies* XI (1921); G. Lugli in *Bollettino Comunale* (1923); T. Ashby, *The Roman Campagna in Classical Times*, chap. xii (1927).

SAXE, JOHN GODFREY (1816-1887), American poet, humorist and editor, was born at Highgate, Vt., June 2, 1816. He was best known as a writer of humorous verse and a lecturer. Some of his lyrics have genuine feeling as well as grace. His "Rhyme of the Rail," "The Proud Miss McBride," "I'm Growing Old" and "Treasures in Heaven" were once very popular. Among his published collections are *Humorous and Satirical Poems* (1850), *The Times, The Telegraph, and other Poems* (1865), and *Leisure Day Rhymes* (1875). He died at Albany, N. Y., March 31, 1887.

SAXE, MAURICE, COMTE DE (1696-1750), marshal of France, was the natural son of Augustus II. of Saxony and the countess Aurora Königsmark. In 1698 the countess sent him to Warsaw to his father, who had been elected king of Poland in the previous year, but on account of the unsettled condition of the country the greater part of his youth was spent outside its limits. He served under Prince Eugène in the Netherlands, and under Peter the Great against the Swedes. After receiving in 1711 formal recognition from his father, with the rank of count, he accompanied him to Pomerania, and in 1712 he took part in the siege of Stralsund. In manhood he bore a strong resemblance to his father, both in person and character. His grasp was so powerful that he could bend a horse-shoe with his hand, and to the last his energy and endurance were scarcely subdued by the illnesses resulting from his many excesses. In 1714 he married a rich wife, Johanna Victoria, countess von Loeben, but he dissipated her fortune so rapidly that he was soon heavily in debt, and the marriage was annulled in 1721. Meantime, after serving in a campaign against the Turks in 1717, he had in 1719 gone to Paris, to study mathematics, and in 1720 obtained a commission as *maréchal de camp*. In 1725 negotiations were entered into for his election as duke of Courland, at the instance of the duchess Anna Ivanovna, who offered him her hand. He was chosen duke in 1726, but declining marriage with the duchess found it impossible to resist her opposition to his claims, although, with the assistance of £30,000 lent him by the French actress Adrienne Lecouvreur, he raised a force by which he maintained his authority till 1727, when he withdrew and took up his residence in Paris. On the outbreak of the war in 1734 he served under Marshal Berwick, and for a brilliant exploit at the siege of Philippsburg he was in August named lieutenant-general. On the opening of the Austrian Succession War in 1741, he took command of a division of the army sent to invade Austria, and on Nov. 19 surprised Prague during the night, and took it by assault before the garrison were aware of the presence of an enemy. After capturing the fortress of Eger on April 19, 1742, he received leave of absence, and went to Russia to push his claims on the duchy of Courland, but obtaining no success he returned to his command. His exploits had been the sole redeeming feature in an unsuccessful campaign, and on March 26, 1743, he was promoted to be marshal of France.

Marshal Saxe was now one of the first generals of the age. In 1744 he was chosen to command the expedition to England on behalf of the Pretender, which assembled at Dunkirk but did not proceed farther. After its abortive issue he received an independent command in the Netherlands, and by dexterous manoeuvring succeeded in continually harassing the superior forces of the enemy without risking a decisive battle. In the following year he besieged Tournai and inflicted a severe defeat on the relieving army of the duke of Cumberland at Fontenoy (q.v.). Thenceforward to the end of the war he continued to command in the Netherlands, always with success. Besides Fontenoy he added Rocoux (1746) and Lawfeldt or Val (1747) to the list of French victories, and it was under his orders that Marshal Löwendahl captured Bergen-op-Zoom. He himself won the last success of the war in capturing Maestricht in 1748. In 1747 the title formerly held by Turenne, "Marshal general of the King's camps and armies," was revived for him. But on Nov. 30, 1750, he died at Chambord.

In 1748 there had been born to him a daughter, one of several illegitimate children, whose granddaughter was George Sand. Saxe was the author of a remarkable work on the art of war, *Mes Réveries*, which though described by Carlyle as "a strange military farrago, dictated, as I should think, under opium," is in fact a classic. It was published posthumously in 1757 (ed.

Paris, 1877).

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SAXE-ALTENBURG. The district, later the duchy of Saxe-Altensburg, came into the possession of the margrave of Meissen about 1329, and later with Meissen formed part of the electorate of Saxony. In 1603 Saxe-Altensburg was made a separate duchy, lasting until 1672. In 1825 it again became a separate duchy under Frederick, previously Duke of Saxe-Hildburghausen. His family's reign was ended by the German revolution of 1918.

SAXE-COBURG-GOTHA, formerly a sovereign duchy of Germany and a constituent member of the German empire, and after 1919 incorporated into Thuringia (*q.v.*).

History.—The district of Coburg came into the possession of the family of Wettin in the 14th century, and after the Wettins had become electors of Saxony this part of their lands fell at the partition of 1485 to the Ernestine branch of the house. From that time onward Coburg, Gotha and Saalfeld were frequently partitioned and repartitioned until 1826, when Ernest, duke of Saxe-Coburg-Saalfeld, exchanged Saalfeld for Gotha, took the title of duke of Saxe-Coburg-Gotha and became the founder of the house which ruled until the revolution of 1918. On the death of Ernest II in 1893 the succession passed to the children of his brother Albert, the English prince consort, whose son Prince Alfred reigned from 1893 to 1900 and was succeeded by his nephew Charles Edward, duke of Albany, the last reigning duke.

SAXE-MEININGEN, a former grand duchy of Germany, and after 1919 a part of Thuringia (*q.v.*).

History.—The Duchy of Saxe-Meiningen, or more correctly Saxe-Meiningen-Hildburghausen, was founded in 1681 by Bernard, the third son of Ernest the Pious, duke of Saxe-Gotha, and consisted originally of the western part of the later duchy, the district around Meiningen. By the rearrangement of the Saxon duchies in 1826, Saxe-Meiningen benefited greatly, its area being more than doubled by the receipt of 530 sq.mi. of territory. The additions consisted of the duchy of Saxe-Hildburghausen, the duchy of Saxe-Saalfeld, which had been united with Saxe-Coburg in 1735, and the districts of Themar, Kranichfeld and Kamburg. Saxe-Meiningen became a member of the new German empire in 1871. In 1918 the ruling family lost its power in the general revolution.

SAXE-WEIMAR-EISENACH, formerly a grand duchy of Germany and a sovereign and constituent state of the German empire, and after 1919 part of Thuringia (*q.v.*).

History.—In early times Weimar and district belonged to the counts of Orlamünde, and from the end of the 10th century until 1067 it was the seat of the counts of Weimar. In the 14th century it passed to the elector of Saxony, falling at the partition of 1485 to the Ernestine branch of the Wettin family. It was not until 1641 that Saxe-Weimar emerged into an independent historical position. In this year, having inherited Coburg and Eisenach, the three brothers, William, Albert and Ernest, founded the three principalities of Saxe-Weimar, Saxe-Eisenach, and Saxe-Gotha. Eisenach fell to Saxe-Weimar in 1644, and although the enlarged principality of Saxe-Weimar-Eisenach was temporarily split up into the lines Saxe-Weimar, Saxe-Eisenach and Saxe-Jena, it was united under Ernest Augustus, who began to reign in 1728. The reign of Charles Augustus, who assumed the government in 1775, is the most brilliant in the history of Saxe-Weimar. He attracted to his court the leading scholars in Germany; Goethe, Schiller and Herder were members of this band, and the little state attracted the eyes of all Europe.

The Congress of Vienna in 1815 added about 660 sq.mi. to its area and gave its ruler the title of grand duke. Charles Augustus was the first German sovereign to give a constitution to his state

under Article XIII of the Federal act. Freedom of the press being secured under its constitution, Weimar became a focus of liberal agitation, which drew down upon the grand duke the wrath of the reactionary powers (*see GERMANY: The Growth of Prussia*). He was thus forced to curtail some of the liberties granted. In 1866 the grand duchy joined Prussia against Austria and afterward entered the North German confederation and the new German empire. In 1919 it was absorbed in the republican state of Thuringia (a Land after 1933), with the capital at Weimar.

SAXHORN, the generic name of a family of brass wind instruments (not horns but valve-bugles) with cup-shaped mouth-pieces, invented by Adolphe Sax and in use chiefly in French and other European military bands, instruments of a brighter tone quality being preferred in the United States for the same purposes. (*See BOMBARDON; BUGLE; HORN; TUBA; VALVES [PISTONS].*)

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SAXIFRAGACEAE, a small family of dicotyledons belonging to the subclass Archichlamydeae and the cohort Rosales. There are 80 genera with about 900 species distributed through the arctic and north temperate zone, often alpine. It is represented in Britain by its largest genus, *Saxifraga* (*see SAXIFRAGE*), *Chrysosplenium* (golden saxifrage) and *Parnassia* (grass of Parnassus). The plants are herbs, generally with scattered exstipulate

leaves with a broad leaf-base. The small flowers are generally arranged in cymose inflorescences and are bisexual, regular and hypogynous, perigynous or more frequently more or less epigynous, this variation in the relative position of the ovary occurring in one and the same genus *Saxifraga*. The free stamens are ob-diplostemonous, i.e., those of the outer whorl are opposite to the petals, and two carpels. The carpels are sometimes free, more generally united at the base, or sometimes completely joined to form a one- or two-chambered ovary with two free styles. The fruit is a many-seeded capsule.

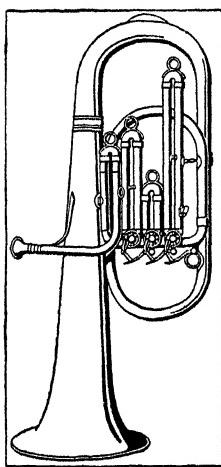
Nearly half the species (350) are contained in the genus *Saxifraga*. *Chrysosplenium*, with 45 species, two of which are British, has a very similar distribution. The North American genus *Heuchera* has sometimes apetalous flowers. *Astilbe* has 20 species in temperate Asia and northeastern North America; *A. japonica* is commonly grown in the spring as a pot-plant and often misnamed *Spiraea*.

The family is now extended to include other groups of genera differing in habit and more or less in general conformation from those referred to. Among these is the genus *Ribes*, to which belong the gooseberry (*R. grossularia*) and currants of gardens. These are shrubs with racemes of flowers which have only one whorl of stamens (isostemonous), an inferior unilocular ovary with two parietal placentas, the fruit a berry. Other genera are *Hydrangea* (*q.v.*), *Deutzia* and *Philadelphus*, all well-known garden plants; *P. coronarius* is the so-called syringa or mock-orange. They are shrubs or trees with simple, generally opposite leaves, pentamerous flowers with epigynous stamens and a tri- to pentalocular ovary. *Escallonia*, which represents a small group of genera with leathery gland-dotted leaves, is also included.

In North America, *Saxifraga* is represented by about 30 species, the other prominent genera being *Ribes* (currant and gooseberry), with 20 species, and *Heuchera* (alum root), with 10 species.

For a treatment of the genera see A. Engler, "Saxifragaceae," Engler and Prantl, *Die Natiürlichen Pflanzenfamilien*, ed. 2, 18a: 74-226, fig. 64-132 (1930).

SAXIFRAGE (*Saxifraga*), a genus of plants which gives its



BY COURTESY OF THE METROPOLITAN MUSEUM OF ART
THE SAXHORN (A MODIFICATION OF THE KEYED BUGLE) INVENTED BY ADOLPHE SAX IN 1843

name to the family (Saxifragaceae) of which it is a member. There are about 400 species distributed in the temperate and arctic parts of the northern hemisphere, frequently at considerable heights on the mountains, and also found on the Andes. They are mostly herbs, native to mountains and rocky places, with perennial rootstocks and leaves in tufts or scattered on the flower-stalks.

The arrangement of the flowers is very various, as also are the size and colour of the flowers themselves. Thirteen species are found in Britain, some alpine plants of great beauty (*S. oppositifolia*, *S. nivalis*, *S. aizoides*, etc.) and others, like *S. granulata*, frequenting meadows and low ground, while *S. tridactylites* may be found on almost any dry wall. *S. umbrosa* is London pride or St. Patrick's cabbage, a common garden plant, a native of the Spanish peninsula and also of the mountains of west and southwest Ireland.

Some 85 species occur in North America, most numerously in the Rocky mountain region. Well-known species are the early saxifrage (*S. virginensis*) and the swamp saxifrage (*S. pennsylvanica*), of the eastern United States and Canada, and the tufted saxifrage (*S. caespitosa*), found on rocks in mountains across the continent. Many species are in cultivation, including the numerous alpine species, such as *S. cotyledon*, with tall panicles studded with white flowers, and others, many adapted for rockwork. The strawberry-geranium (*S. sarmentosa*) is an old conservatory and window plant.

The saxifrages are among the most interesting alpine plants for culture in the rock garden. Some grow best in clefts in the rocks, others in gritty detritus characteristic of moraines. Nearly 200 species are cultivated by fanciers. Most of them prefer gritty soils, perfect drainage and freedom from acid conditions. Many are from alpine fell fields and will not stand too much midday heat. Among the best for rock gardens in the U.S. are *Saxifraga aizoon* (with several varieties); *S. apiculata*, a cushion plant; *S. cochlearis*, best grown in crushed limestone; *S. decipiens* (with hybrids of several colours); *S. hostii*, a cushion plant with white flowers; *S. moschata*, a dwarf, moss-like species; and *S. oppositifolia*, which makes prostrate mats and has many varieties. (N. Tr.; X.)

SAXO GRAMMATICUS (c. 1150–c. 1206), Danish historian and poet, belonging to a family of warriors, his father and grandfather having served under Valdemar I., king of Denmark (d. 1182). Saxo was in the service of Archbishop Absalon from about 1182 to 1201. At the archbishop's suggestion he began, about 1185, to write the history of the Danish Christian kings from the time of Sweyn Astridson (d. 1076), but later Absalon prevailed on him to write also the history of the earlier heathen times, and to combine both into a great work, *Gesta Danorum*, or *Historia Danica*. The archbishop died before the work was finished, and therefore the preface, written about 1208, dedicates the work to his successor Archbishop Andreas, and to King Valdemar II. Nothing else is known about Saxo's life and person; a chronicle of 1265 calls him "mirae et urbanae eloquentiae clericus"; and an epitome of his work from about 1340 describes him as "egregius grammaticus, origine Sialandicus."

The surname of "Grammaticus" is probably of later origin, scarcely earlier than 1500, apparently owing to a mistake. The title of "provost of Röskilde," given him in the 16th century, is also probably incorrect, the historian being confounded with an older contemporary, the provost of the same name. Saxo, from his apprenticeship as the archbishop's secretary, had acquired a brilliant but somewhat euphuistic Latin style, and wrote fine Latin verses, but otherwise he does not seem to have had any very great learning or extensive reading. His models of style were Valerius Maximus, Justin and Martianus Capella, especially the last. Occasionally he mentions Bede, Dudo of St. Quentin and Paulus Diaconus, but he does not seem to have studied them or any other historical works thoroughly. His sources are partly Danish traditions and songs, partly the statements of Archbishop Absalon, partly the accounts of Icelanders and, lastly, some few earlier sources, lists of Danish kings and short chronicles, which furnished him with some reliable chronological facts. His work is a loose series of biographies of Danish kings and heroes.

The first nine books of the *Gesta Danorum* comprise traditions of kings and heroes of the half-mythical time up to about 950. Here we have traditions about Fredfrode, about Amleth (Hamlet) and Fenge, about Hrolfr Kraki, Hadding, the giant Starkather, Harald Hildetann and Ragnarr Lodbrok. In this earlier history Saxo has also embodied myths of national gods who in tradition had become Danish kings, for instance, Balder and Hother, and of foreign heroes, likewise incorporated in Danish history, as the Gothic Jarmunrik (A.S. Eormenric), the Anglian Vermund (A.S. Gármund) and Uffe (A.S. Offa), the German Hedin and Hild and others. Frequently the narrative is interrupted by translations of poems, which Saxo has used as authentic sources, although they are often only a few generations older than himself. In the later books (x.–xvi.) of his work he follows to a greater extent historical accounts, and the more he approaches his own time the fuller and the more trustworthy his relation becomes; especially brilliant is his treatment of the history of King Valdemar and of Absalon. But his patriotism and want of critical sense often blind him to the historical truth.

Saxo's work was published for the first time, from a ms. afterwards lost, in Paris, 1514, by the Danish humanist Christiern Pedersen; this edition was reprinted at Basel, 1534, and at Frankfurt, 1576. The last complete edition is that of Alfred Holder (Strassburg, 1886). There is an English translation by O. Elton and F. Y. Powell (London, 1894). There is a later edition of the first nine books of Saxo's works, *Saxo Grammaticus: Die ersten neun Bücher der dänischen Geschichte* (ed. H. Jantzen, 1899–1900); and a commentary and German trans., P. Hermann, *Erläuterungen zu den ersten neun Büchern der dänischen Geschichte des Saxo Grammaticus* (1901–02). There is also a new Danish edition, *Sakses Danesaga* (ed. J. Olick, 1925), and a Danish study of Saxo's life and work, S. C. Larsen, *Saxo Grammaticus, hans Verk og Person* (1925).

SAXONS, a Teutonic people mentioned for the first time by Ptolemy about the middle of the 2nd century. At that time they are said to have inhabited the neck of the Cimbric peninsula, by which we have probably to understand the modern province of Schleswig, together with three islands lying off its western coast. We next hear of them in connection with piratical expeditions in the North sea about the year 286. These raids became more frequent during the 4th century, and at the beginning of the 5th century the northern coast of Gaul and the south-east coast of Britain were known at *litora Saxonica*. During the same period the Saxons appear to have conquered a considerable portion of north-west Germany. According to their own traditions they landed at Hadeln in the neighbourhood of Cuxhaven and seized the surrounding districts from the Thuringians. By the middle of the 4th century they had advanced westwards into the basin of the Ysel, and in the following centuries we find them in possession of the whole of the basin of the Ems, except the coast district, while that of the Weser with all its tributaries belonged to them as far south as the Diemel, where they bordered on the Hessian Franks, the ancient Chatti. The conquest of the Boructuari who dwelt between the Lippe and the Ruhr marks the extent of their progress towards the south-west. This took place shortly before the end of the 7th century. They frequently came into conflict with the Franks and on several occasions had to submit to their supremacy. No thorough conquest was, however, carried until the time of Charlemagne, who, between the years 772 and 785, annexed the whole region as far as the Elbe, destroying in 772 the Irminsul, their great sanctuary, near Marsberg on the Diemel. Up to this time they had remained entirely heathen. At the beginning of the following century Charlemagne also conquered the Saxons known as Nordalbingi in western Holstein, a district which had perhaps been occupied by a southward movement from the original home of the tribe.

It is doubtful how far the Saxons who invaded Britain were really distinct from the Angli, for all their affinities both in language and custom are with the latter and not with the Saxons (Old Saxons) of the Continent. During the 5th century we hear also of Saxon settlements on the coasts of Gaul. The most important were those at the mouth of the Loire founded in the time of Childeric, Clovis's father, and at Bayeux, in a district which remained in their possession until towards the close of the 6th century. From the 6th century onwards, however, we hear practically

SAXONY

nothing of the Saxons as a seafaring people. Almost all the southern coast of the North sea had now come into the possession of the Frisians, and one can hardly help concluding that most of the maritime Saxons had either voluntarily or by conquest become incorporated in that kingdom.

See Ptolemy ii, 11; Eutropius ix, 21; Zosimus iii, 6; Ammianus Marcellinus xxvi, 4, 5, xxvii, 8, 5, xxviii, 2, 12, 7, 8, xxx, 5, 1 and 4; *Notitia dignitatum*; Gregory of Tours, *Historia Francorum*, ii, 19, iv, 10, 14, v, 27, x, 9; Bede, *Hist. Eccl.* v, 10 seq.; *Annales Eichardi*; *Translatio S. Alexandri*; Hucbald, *Vita S. Leobini*; Widukind, *Res Gestae Saxonicae*, i, 1 ff. (F. G. M. B.)

SAXONY, one of the German *Länder*, ranking among the constituent states of the German reich fifth in area and third in population, bounded in 1938 S. by Czechoslovakia, on the west by Bavaria and Thuringia and on the west, north and east by Prussia. Its frontiers have a circuit of 760 mi. and, with the exception of some small exclaves and enclaves, it forms a compact whole of a triangular shape, its base extending from northeast to southwest, and its apex pointing northwest. Its greatest length is 130 mi., greatest breadth 93 mi., and total area 5,789 sq.mi.

Physical Features.—Saxony belongs almost entirely to the central mountain region of Germany, only the districts along the north border and around Leipzig descending into the great north-European plain. The chief mountain range is the Erzgebirge, stretching for 90 mi. along the south border, and reaching in the Fichtelberg (3,979 ft. and 3,953 ft.) the highest elevation in the country. The west and southwest are occupied by ramifications and subsidiary groups of this range, such as the Central Saxon chain, and the Oschatz group. The southeast angle of Saxony is occupied by the mountains of Upper Lusatia (highest summit 2,600 ft.). Northwest from this group, and along both banks of the Elbe, which divides it from the Erzgebirge, extends the picturesque Saxon Switzerland. The action of water and ice upon the soft sandstone of which the hills here are chiefly composed has produced deep gorges and isolated fantastic peaks, but the highest summit attains a height of only 1,830 ft.; the more interesting peaks, as the Lilienstein, Königstein and the Bastei, are lower. Saxony lies almost wholly in the basin of the Elbe, which has a navigable course of 72 mi. from southeast to northwest. The Mulde, formed of two branches, is the second river of Saxony; others are the Black Elster, the White Elster, the Pleisse and the Spree, all part of the Elbe system. There are no lakes of any size. The best known of many mineral springs is at Bad Elster in the Vogtland.

Climate.—The climate is mildest in the valleys of the Elbe, Mulde and Pleisse and severest in the Erzgebirge. The average temperature varies from 48° to 50°. The Erzgebirge is the rainiest district, 27½ to 33½ in. falling yearly; the amount decreases as one proceeds northward, and Leipzig, with an average annual rainfall of 17 in., enjoys the driest climate.

Population.—In 1939 the population of Saxony was 5,206,822, or 899.4 per square mile. Except the free towns, Saxony is the most densely peopled member of the German reich. The growth of the population after 1815, when Saxony received its present limits, has been as follows: (1815) 1,178,802; (1830) 1,402,066; (1840) 1,706,275; (1864) 2,344,094; (1875) 2,760,586; (1895) 3,787,688; (1905) 4,508,601. The preponderating industrial activity fosters the tendency of the population to concentrate in towns, and no German area, with the exception of the Hanseatic towns, has so large a proportion of urban population. The people of Saxony are chiefly of pure Teutonic stock; a proportion are Germanized Slavs, and to the south of Bautzen there is a large settlement of Wends, who retain their language.

The chief towns are Leipzig (pop. 1939, 701,606), Dresden (625,174), Chemnitz (334,563), Plauen (110,342), Zwickau (85,484), Meissen (47,833), Bautzen (41,793), Zittau (38,271), Freiberg (35,847), Freital (36,652), Pirna (36,130), Reichenbach (31,266), Glauchau (33,586), and Krimmitschau (26,942). Other important towns are Meerane and Werdau.

Communications.—The roads in Saxony are numerous and good, and there are over 1,268 mi. of railway. The only navigable river is the Elbe.

Agriculture.—Saxony is one of the most fertile parts of

Germany, and is highly developed agriculturally. Fertility diminishes as we ascend towards the south, until on the bleak crest of the Erzgebirge cultivation ceases. In 1834 a law was passed providing for the union of the scattered lands belonging to each proprietor, and that may be considered the dawn of modern Saxon agriculture. The richest grain districts are near Meissen, Grimma, Bautzen, Döbeln and Pirna. The chief crop is rye, but oats are hardly second to it. Wheat and barley are grown in considerably less quantity. Very large quantities of potatoes are grown, especially in the Vogtland. Beet is also grown extensively. Flax is grown in the Erzgebirge and Lusatian mountains, where the manufacture of linen was at one time a flourishing domestic industry. Enormous quantities of cherries, plums and apples are annually borne by the trees round Leipzig, Dresden and Colditz. The Saxon vineyards, chiefly on the banks of the Elbe near Meissen and Dresden, have passed through difficult times of late years, owing to the ravages of the phylloxera.

Livestock.—Cattle rearing, which has been an industry since the advent of the Wends in the 6th century, is important on the extensive pastures of the Erzgebirge and in the Vogtland. In 1765 the regent Prince Xaver imported 300 merino sheep from Spain, and so improved the native breed by this new strain that Saxon sheep were eagerly imported by foreign nations to improve their flocks, and "Saxon electoral wool" became one of the best brands in the market. Sheep farming, however, has considerably declined within the last few decades. Swine furnish a very large proportion of the flesh diet of the people. Geese abound particularly round Leipzig and in Upper Lusatia, poultry about Bautzen.

Forests.—The forests of Saxony are extensive and have long been well cared for both by government and by private proprietors. The famous school of forestry at Tharandt was founded in 1811. The Vogtland is the most densely wooded portion of Saxony, and next comes the Erzgebirge.

Mining.—Silver was raised in the 12th century, and argentiferous lead is still the most valuable ore mined; tin, iron and cobalt rank next, and coal is one of the chief exports. Copper, zinc and bismuth are also worked. The country is divided into four mining districts: Freiberg, where silver and lead are the chief products; Altenberg, where tin is mainly raised; Schneeberg, yielding cobalt, nickel and ironstone; and Johanngeorgenstadt, with ironstone and silver mines. The coal is found principally in two fields—one near Zwickau, and the other in the governmental district of Dresden. Brown coal or lignite is found chiefly in the north and northwest. Peat is especially abundant on the Erzgebirge. Immense quantities of bricks are made all over the country. Excellent sandstone for building is found on the hills of the Elbe. Fine porcelain clay occurs near Meissen, and coarser varieties elsewhere.

Industries.—The central-European position of Saxony has fostered its commerce; and its manufactures have been encouraged by the abundant water power throughout the country. Nearly one-half of the motive power used in Saxon factories is supplied by the streams, of which the Mulde, in this respect, is the chief. The early foundation of the Leipzig fairs, and the enlightened policy of the rulers of the country, have also done much to develop its commercial and industrial resources. The manufacture of textiles is carried on at Zwickau, Chemnitz, Glauchau, Meerane, Hohenstein, Kamenz, Pulsnitz and Bischofswerda. The centre of the cotton manufacture (especially of cotton hosiery) is Chemnitz; cotton muslins are made throughout the Vogtland, ribbons at Pulsnitz and its neighbourhood. Woollen cloth and buckskin are woven at Kamenz, Bischofswerda and Grossenhain, all in the northeast, woollen and half-woollen under-clothing at Chemnitz, Glauchau, Meerane and Reichenbach; while Bautzen and Limbach produce woollen stockings. Linen is manufactured chiefly in the mountains of Lusatia, where the looms are still to some extent found in the homes of the weavers. Damask is produced at Gross-Schönau and other places. Lace-making, discovered or introduced by Barbara Uttmann in the latter half of the 16th century, and now fostered by government schools, was long an important domestic industry among the villages of the Erzgebirge, and has attained to a great industry.

in Plauen. Straw-plaiting is carried on by the inhabitants of the mountain slopes between Gottleuba and Lockwitz. Waxcloth is manufactured at Leipzig, and artificial flowers at Leipzig and Dresden. Stoneware and earthenware are made at Chemnitz, Zwickau, Bautzen and Meissen, porcelain ("Dresden china") at Meissen, chemicals in and near Leipzig. Döbeln, Werdau and Loschwitz are the chief seats of the Saxon leather trade; cigars are very extensively made in the town and district of Leipzig, and hats and pianofortes at Leipzig, Dresden and Chemnitz. Paper is made chiefly in the west of Saxony. Machinery of all kinds is produced, from the sewing-machines of Dresden to the steam-locomotives and marine-engines of Chemnitz. The last-named place, though the centre of the iron-manufacture of Saxony, has to import every pound of iron by railway. The leading branch is the machinery used in the industries of the country—mining, paper-making and weaving. The very large printing trade of Leipzig encourages the manufacture of printing-presses in that city. There are a number of active breweries in Saxony. The smelting and refining of the metal ores is also an important industry.

The principal exports are wool, woollen, cotton, linen goods, machinery, china, pianofortes, cigarettes, flannels, stockings, curtains and lace, cloth from Reichenbach and Zittau, watches of superlative value from Glashütte and toys from the Vogtland.

Government.—The republican constitution of 1920 provided for a Landtag of 96 members. After 1933 this was superseded by the administration of a national socialist district leader (*Gau-leiter*) and federal governor (*Reichsstatthalter*), Martin Mutschmann, appointed by Hitler.

The Saxon Oberlandesgericht has its seat at Dresden, and the Reichsgericht—the supreme court of law for the whole German reich—at Leipzig.

Church.—The great majority of the inhabitants of Saxony are Protestants. The government of the Evangelical-Lutheran Church was vested in the Evangelical Consistory at Dresden. Its representative assembly consisting of clergymen and lay members was called a synod (*Synode*). The Moravian Brethren established their chief seat at Herrnhut.

Education.—Of the four universities founded by the Saxon electors at Leipzig, Jena, Wittenberg, later transferred to Halle, and Erfurt, now extinct, only the first is included in Saxony. There are famous endowed schools (*Fürstenschulen*) at Meissen and Grimma. Saxony is particularly well equipped with technical schools, the textile industries being especially fostered by numerous schools of weaving, embroidery and lacemaking; but the mining academy at Freiberg and the school of forestry at Tharandt are probably the most widely known. The conservatory of music at Leipzig and the art collections at Dresden have a worldwide reputation.

HISTORY

The name Saxony has been borne by two distinct blocks of territory. The first was the district in the north-west of Germany, inhabited originally by the Saxons, which became a duchy and attained its greatest size and prosperity under Henry the Lion in the 12th century. In 1180 it was broken up, and the name of Saxony disappeared from the greater part of it, remaining only with the districts around Lauenburg and Wittenberg. Five centuries later Lauenburg was incorporated with Hanover, and Wittenberg is the nucleus of modern Saxony, the name being thus transferred from the west to the east of Germany. In 1423 Meissen and Thuringia were united with Saxe-Wittenberg under Frederick of Meissen, and gradually the name of Saxony spread over all the lands ruled by this prince and his descendants.

The earlier Saxony was the district lying between the Elbe and the Saale on the east, the Eider on the north and the Rhine on the west, with a fluctuating boundary on the south. This territory was a stronghold of Germanic heathenism and included at Eresburg, the modern Marsberg, one of the chief Germanic sanctuaries, marked by the *Irminsul*, a wooden pillar which was the centre of Saxon worship. The prolonged resistance which the Saxons offered to Christianity was chiefly due to their hostility to

the Franks who threatened their independence. The reduction of the Saxons was attempted by Charles Martel and Pippin the short, and was finally carried through in a series of campaigns by Charles the Great (*q.v.*) (Charlemagne). Before his death Saxony passed under Frankish supremacy, and within a century it had come to form an outpost of German and Christian influence against the Slavs of the provinces south of the Baltic.

The conversion of the Saxons to Christianity, which during this time had been steadily progressing, was continued in the reign of the emperor Louis I. Bishoprics were established at Bremen, Münster, Verden, Minden, Paderborn, Osnabrück, Hildesheim, Hamburg and Halberstadt. The abbey of Corvey soon became a centre of learning for the country, and the Saxons undertook with the eagerness of converts the conversion of their heathen neighbours. Towards the middle of the century there were signs of a reaction against Frankish rule and towards heathenism among the Saxon free peasantry, but it had no permanent result, and the connection with the empire was unbroken. By the treaty of Verdun in 843 Saxony fell to Louis the German, but he paid little attention to the northern part of his kingdom, which was harassed by the Normans and the Slavs. About 850, however, he appointed a Saxon noble named Liudolf as margrave to defend the *Limes Saxoniae*, a narrow strip of land on the eastern frontier. Liudolf, who is sometimes called "duke of the East Saxons," carried on a vigorous warfare against the Slavs and extended his influence over other parts of Saxony. He died in 866, and was succeeded by his son Bruno, who was killed fighting the Normans in 880. Liudolf's second son, Otto the Illustrious, was recognized as duke of Saxony by King Conrad I., and on the death of Burkhard, margrave of Thuringia in 908, obtained authority over that country also. He made himself practically independent in Saxony, and played an important part in the affairs of the empire. He died in 912 and his son Henry I., the Fowler, not only retained his hold over Saxony and Thuringia, but in 919 was elected German king. He extended the Saxon frontier almost to the Oder, improved the Saxon forces by training and equipment, established new marks, and erected forts on the frontiers for which he provided regular garrisons. Towns were walled, where it was decreed markets and assemblies should be held, churches and monasteries were founded, civilization was extended and learning encouraged. Henry's son, Otto the Great, was crowned emperor in 962, and his descendants held this dignity until the death of the emperor Otto III. in 1002. Under this able dynasty the Slavs were driven back, the domestic policy of Henry the Fowler was continued, the Saxon court became a centre of learning visited by Italian scholars, and in 968 an archbishopric was founded at Magdeburg for the lands east of the Elbe. The extent of Otto the Great's dominions compelled him to delegate much of his authority in Saxony and in 960 he gave to a trusted relative Hermann Billung certain duties and privileges on the eastern frontier, and from time to time appointed him as his representative in Saxony. Hermann gradually extended his authority, and when he died in 973 was followed by his son Bernard I., who was undoubtedly duke of Saxony in 986. When Henry II. was chosen German king in 1002 he met the Saxons at Merseburg, and on promising to observe their laws Bernard gave him the sacred lance, thus entrusting Saxony to his care. Bernard was succeeded by his son Bernard II., who took up a hostile attitude towards the German kings, Conrad II. and Henry III. His son and successor Ordulf, who became duke in 1059, carried on a long and obstinate struggle with Adalbert, archbishop of Bremen, who was compelled to cede one-third of his possessions to Ordulf's son Magnus in 1066. The emperor Henry III. sought to win the allegiance of the Saxons by residing among them. He built a castle at Goslar and the Harzburg; and his successor Henry IV. also spent much time in Saxony.

In 1070 Otto of Nordheim, duke of Bavaria, who held large estates in this country, was accused of a plot to murder Henry, and his lands were confiscated. Otto, in alliance with Magnus, won considerable support in Saxony, but after some fighting both submitted and were imprisoned; and Magnus was still in confinement when on his father's death in 1072 he became titular duke of Saxony. As he refused to give up his duchy he was kept

in prison, while Henry confiscated the estates of powerful nobles, demanded the restoration of ducal lands by the bishops, and garrisoned newly-erected forts with Swabians. These proceedings aroused suspicion and discontent, which were increased when the emperor assembled an army, ostensibly to attack the Slavs. The Saxon nobles refused to join the host until their grievances were redressed, and in 1073 a league was formed at Wormesleben. When the insurgents under Duke Otto were joined by the Thuringians, Henry was compelled in 1074 to make various concessions to them, and in particular to release Magnus. At last Henry, having obtained help from the princes of the Rhineland, attacked and defeated the Saxons at Hohenburg near Langensalza but pardoned Otto, whom he appointed administrator of the country. The Saxons, however, were not quite subdued; risings took place from time to time, and the opponents of Henry IV. found considerable support in Saxony. During the century which followed the death of Hermann Billung, there had been constant warfare with the Slavs, but although the emperors had often taken the field, the Saxons had been driven back to the Elbe, which was at this time their eastern boundary. In 1106 Magnus died, and the German king Henry V. bestowed the duchy upon Lothair, count of Supplinburg, whose wife Richenza inherited the Saxon estates of her grandfather Otto of Nordheim, on the death of her brother Otto in 1116. Lothair quickly made himself independent, defeated Henry at Welfesholz in 1115, and prosecuted the war against the Slavs with vigour. In 1125 he became German king, and in 1137 gave Saxony to Henry the Proud, duke of Bavaria, who had married his daughter Gertrude, and whose mother Wulfhild was a daughter of Magnus Billung. The succeeding German king Conrad III. refused to allow Henry to hold two duchies, and gave Saxony to Albert the Bear, margrave of Brandenburg, who like his rival was a grandson of Magnus Billung. Albert's attempts to obtain possession failed, and after Henry's death in 1139 he formally renounced Saxony in favour of Henry's son, Henry the Lion (*q.v.*). The new duke improved its internal condition, increased its political importance, and pushed its eastern frontier towards the Oder. In 1180, however, he was placed under the imperial ban and Saxony was broken up. Henry retained Brunswick and Luneburg; Westphalia, as the western portion of the duchy was called, was given to Philip, archbishop of Cologne, and a large part of the land was divided among nine bishops and a number of counts who thus became immediate vassals of the emperor. The title duke of Saxony was given to Bernard, the sixth son of Albert the Bear, together with the small territories of Lauenburg and Wittenberg, which were thus the only portions of the former duchy which now bore the name of Saxony. Bernard, whose paternal grandmother, Eilicke, was a daughter of Magnus Billung, took a prominent part in German affairs, but lost Lauenburg which was seized by Waldemar II., king of Denmark. Dying in 1212, Bernard was succeeded in Wittenberg by his younger son Albert I., who recovered Lauenburg after the defeat of Waldemar at Bornhöved in 1227. Albert died in 1260, and soon after his death his two sons divided his territories, when the elder son John took Lauenburg which was sometimes called lower Saxony, and the younger, Albert II., took Wittenberg or upper Saxony. Both retained the ducal title and claimed the electoral privilege, a claim which the Lauenburg line refused to abandon when it was awarded to the Wittenberg line by the Golden Bull of 1356.

Saxe-Lauenburg was governed by John until his death in 1285, when it passed to his three sons John II., Albert III. and Eric I. As Albert had no sons the duchy was soon divided into two parts, until on the death of duke Eric III., a grandson of John II., in 1401, it was reunited by Eric IV., a grandson of Eric I. When Eric IV. died in 1412 he was succeeded by his son Eric V., who made strenuous but vain efforts to obtain the electoral duchy of Saxe-Wittenberg, which fell vacant on the death of the elector Albert III. in 1422. Eric died in 1436 and was followed by his brother Bernard IV., whose claim to exercise the electoral vote was quashed by the electors in 1438; and who was succeeded by his son John IV. in 1463. The next duke, John's son Magnus I., spent much time in struggles with the archbishop of Bremen and the

bishop of Ratzeburg; he also assisted the progress of the Reformation in Lauenburg. Magnus, who was formally invested with the duchy by the emperor Charles V. in 1530, was the first duke to abandon the claim to the electoral privilege. After his death in 1543 his son Francis I. reigned for the succeeding 28 years, and his grandsons, Magnus II. and Francis II., until 1619. Francis, who did something to improve the administration of his duchy, was succeeded in turn by his two sons and his two grandsons; but on the death of Julius Francis, the younger of his grandsons, in 1689 the family became extinct.

Several claimants to Saxe-Lauenburg thereupon appeared, the most prominent of whom were George William, duke of Lüneburg-Celle, and John George III., elector of Saxony. George William based his claim upon a treaty of mutual succession made in 1369 between his ancestor Magnus II., duke of Brunswick, and the reigning dukes of Saxe-Lauenburg. John George had a double claim. Duke Magnus I. had promised that in case of the extinction of his family Lauenburg should pass to the family of Wettin, an arrangement which had been confirmed by the emperor Maximilian I. in 1507. Secondly, John George himself had concluded a similar treaty with Julius Francis in 1671. In 1689 the elector received the homage of the people of Lauenburg. George William, however, took Ratzeburg, and held it against the troops of a third claimant, Christian V., king of Denmark; and in 1702 he bought off the claim of John George, his successor being invested with the duchy in 1728. Since that date its history has been identified with that of Hanover (*q.v.*).

In Saxe-Wittenberg Albert II. was succeeded in 1298 by his son Rudolph I., who was followed in 1356 by his son Rudolph II. He in turn was succeeded in 1370 by his half-brother Wenceslaus, who temporarily acquired the duchy of Lüneburg for his house. He was followed in 1388 by his eldest son Rudolph III. Lavish expenditure during the progress of the council of Constance reduced Rudolph to poverty and on the death in 1422 of his brother Albert III., who succeeded him in 1419, this branch of the family became extinct.

THE ELECTORATE

A new era in the history of Saxony dates from 1423, when the Emperor Sigismund bestowed the vacant electoral duchy of Saxe-Wittenberg upon Frederick, margrave of Meissen. Frederick was a member of the family of Wettin, which since his day has played a prominent part in the history of Europe, and he owed his new dignity to the money and other assistance which he had given to the emperor during the Hussite war. The new and more honourable title of elector of Saxony now superseded his other titles, and the name Saxony gradually spread over his other possessions, which included Meissen and Thuringia as well as Saxe-Wittenberg. His new position as elector combined with his personal qualities to make him one of the most powerful princes in Germany, and had the principle of primogeniture been established in his country, Saxony and not Prussia might later have been the leading power in the German empire. He died in 1428, just before his lands were ravaged by the Hussites in 1429 and 1430. The division of his territory between his two sons, the elector Frederick II. and William, occasioned a destructive internecine war. Frederick II.'s two sons, Ernest and Albert, succeeded to their father's possessions in 1464, and for 20 years ruled together peacefully. The land prospered rapidly during this respite from the horrors of war. The childless death of their uncle William in 1482 brought Thuringia to the two princes, and Albert insisted on a division of their common possessions. The important partition of Leipzig accordingly took place in 1485, and resulted in the foundation of the two main lines of the Saxon house. The lands were never again united. Ernest, the elder brother, obtained Saxe-Wittenberg with the electoral dignity, Thuringia and the Saxon Vogtland; while Albert received Meissen, Osterland being divided between them. Something was still held in common, and the division was probably made intricate to render war difficult.

The Reformation Period.—The elector Ernest was succeeded in 1486 by his son, Frederick the Wise, one of the most

illustrious princes in German history. Under him Saxony was perhaps the most influential state in the empire, and became the cradle of the Reformation. He died in 1532 while the Peasants' War was desolating his land, and was succeeded by his brother John, who was an enthusiastic supporter of the reformed faith and who shared with Philip, landgrave of Hesse, the leadership of the league of Schmalkalden. John's son and successor, John Frederick the Magnanimous, who became elector in 1532, might with equal propriety have been surnamed the Unfortunate. He took part in the war of the league of Schmalkalden, but in 1547 he was captured at Mühlberg by the Emperor Charles V. and was forced to sign the capitulation of Wittenberg. This deed transferred the electoral title and a large part of the electoral lands from the Ernestine to the Albertine branch of the house, whose astute representative, Maurice, had taken the imperial side during the war. Only a few scattered territories were reserved for John Frederick's sons, although these were increased by the treaty of Naumburg in 1554, and on them were founded the Ernestine duchies of Saxe-Gotha, Saxe-Weimar, Saxe-Coburg, Saxe-Meiningen and Saxe-Altenburg. For the second time in the history of the Saxon electorate the younger line secured the higher dignity, for the Wittenberg line was junior to the Lauenburg line. The Albertine line became later the royal line of Saxony.

Maurice, who became elector of Saxony in consequence of the capitulation of Wittenberg, was a Protestant, but he did not allow his religious faith to blind him to his political interests. He refused to join the other Protestant princes in the league of Schmalkalden, but made a secret treaty with Charles V. His fidelity to Charles V. was rewarded by the capitulation of Wittenberg. All the lands torn from John Frederick were not, however, assigned to Maurice; he was forced to acknowledge the superiority of Bohemia over the Vogtland and the Silesian duchy of Sagan. Moreover, Roman Catholic prelates were reinstated in the bishoprics of Meissen, Merseburg and Naumburg-Zeitz. Recognizing now as a Protestant prince that the best alliance for securing his new possessions was not with the emperor, but with the other Protestant princes, Maurice began to withdraw from the former and to conciliate the latter. In 1552, suddenly marching against Charles at Innsbruck, he drove him to flight and then extorted from him the peace of Passau.

Amid the distractions of outward affairs, Maurice had not neglected the internal interests of Saxony. To its educational advantages, already conspicuous, he added the three *Fürstenschulen* at Pforta, Grimma and Meissen, and for administrative purposes, especially for the collection of taxes, he divided the country into the four circles of the Electorate, Thuringia, Meissen and Leipzig. During his reign coal-mining began in Saxony. Over 200 religious houses were suppressed, the funds being partly applied to educational purposes. The country had four universities, those of Leipzig, Wittenberg, Jena and Erfurt; books began to increase rapidly, and, by virtue of Luther's translation of the Bible, the Saxon dialect became the ruling dialect of Germany.

Augustus I., brother and successor of Maurice, was one of the best domestic rulers that Saxony ever had. He increased the area of the country by the "circles" of Neustadt and the Vogt-land, and by parts of Henneberg and the silver-yielding Mansfeld, and he devoted his long reign to the development of its resources. Under him lace-making began on the Erzgebirge, and cloth-making flourished at Zwickau. With all his virtues, however, Augustus was an intolerant Lutheran, and used very severe means to exterminate the Calvinists. Under John George (succeeded 1611) the country was devastated by the Thirty Years' War. After the death of Gustavus Adolphus at the battle of Lützen, not far from Leipzig, in 1632, the elector, who was at heart an imperialist, detached himself from Sweden with whom he had been allied since 1629, and in 1635 concluded the peace of Prague with the emperor. By this peace he was confirmed in the possession of Upper and Lower Lusatia. Saxony had now to suffer from the Swedes a repetition of the devastations of Wallenstein. No other country in Germany was so scourged

by this terrible war. When the war was ended by the peace of Westphalia in 1648, Saxony found that its influence had begun to decline in Germany. John George's will made the decline worse by detaching the three duchies of Saxe-Weissenfels, Saxe-Merseburg and Saxe-Zeitz as appanages for his younger sons. By 1746, however, these lines were all extinct, and their possessions had returned to the main line.

The 18th Century.—The next three electors, who each bore the name of John George, had uneventful reigns. John George IV. was succeeded in 1694 by his brother Frederick Augustus I., or Augustus the Strong. This prince was elected king of Poland as Augustus II. in 1697, but any weight which the royal title might have given him in the empire was more than counterbalanced by the fact that he became a Roman Catholic in order to qualify for the new dignity. In order to defray the expenses of Poland's wars with Charles XII. Augustus pawned and sold large districts of Saxon territory, while he drained the electorate of both men and money.

From this reign dates the privy council (*Geheimes Kabinett*), which lasted till 1830. The caste privileges of the estates (*Stände*) were increased by Augustus, a fact which tended to alienate them more from the people, and so to decrease their power. Frederick Augustus II., who succeeded his father in the electorate in 1733, and was afterwards elected to the throne of Poland as Augustus III., was an indolent prince, wholly under the influence of Count Heinrich von Brühl (q.v.). Under him Saxony sided with Prussia in the First Silesian War, and with Austria in the other two. It gained nothing in the first, lost much in the second, and in the third, the Seven Years' War (1756–63), suffered renewed miseries. The country was deserted by its king and his minister, who retired to Poland. By the end of the war it had lost 90,000 men and 100,000,000 thalers; its coinage was debased and its trade ruined; and the whole country was in a state of frantic disorder. The elector died seven months after his return from Poland; Brühl died 23 days later. The connection with Poland was now at an end. The elector's son and successor, Frederick Christian, survived his father only two months, dying also in 1763, leaving a son, Frederick Augustus III., a boy of 13. Prince Xaver, the elector's uncle, was appointed guardian, and he set himself to the work of healing the wounds of the country.

THE KINGDOM OF SAXONY

Frederick assumed the government in 1768, and in his long and eventful reign, which saw the electorate elevated to the dignity of a kingdom, though deprived of more than half its area, he won the surname of the Just. As he was the first king of Saxony, he is usually styled Frederick Augustus I. When the Bavarian succession fell open in 1777, Frederick Augustus joined Prussia in protesting against the absorption of Bavaria by Austria, and Saxon troops took part in the bloodless "potato-war." The elector commuted his claims in right of his mother, the Bavarian princess Maria Antonia, for 6,000,000 florins, which he spent chiefly in redeeming Saxon territory that had been pawned to other German states. When Saxony joined the *Fürstenbund* in 1785, it had an area of 15,185 sq.m. and a population of nearly 2,000,000, but its various parts had not yet been combined into a homogeneous whole, for the two Lusatias, Querfurt, Henneberg and the ecclesiastical foundations of Naumburg and Merseburg had each a separate diet and government, independent of the diet of the electorate proper. In 1791 Frederick declined the proffered crown of Poland. Next year saw the beginning of the great struggle between France and Germany. Frederick's first policy was one of abstention but when war broke out in 1806 against Napoleon, 22,000 Saxon troops shared the defeat of the Prussians at Jena, but the elector immediately afterwards abandoned his former ally. At the peace of Posen (Dec. 11, 1806) Frederick assumed the title of king of Saxony, and entered the Confederation of the Rhine as an independent sovereign, promising a contingent of 20,000 men to Napoleon.

In 1807 his submission was rewarded with the duchy of Warsaw (to which Cracow and part of Galicia were added in 1809) and the district of Kottbus, though he had to surrender some of his former

territory to the new kingdom of Westphalia. The king of Saxony's faith in Napoleon was shaken by the disasters of the Russian campaign, but when the allies invaded Saxony in the spring of 1813, he refused to declare against Napoleon and fled to Prague, though he withdrew his contingent from the French army. After Napoleon's victory at Lützen (May 2, 1813), the Saxon king and the Saxon army were once more at the disposal of the French. During the battle of Leipzig in Oct. 1813, the popular Saxon feeling was displayed by the desertion of the Saxon troops to the side of the allies. Frederick was taken prisoner in Leipzig, and the government of his kingdom was assumed for a year by the Russians. The congress of Vienna assigned the northern portion, consisting of 7,800 sq.m., with 864,404 inhabitants, to Prussia, leaving 5,790 sq.m., with a population of 1,182,744, to Frederick, who was permitted to retain his royal title. On June 8, 1815, King Frederick joined the new German Confederation.

Constitutionalism.—From the partition in 1815 to the war of 1866 the history of Saxony is mainly a narrative of the slow growth of constitutionalism and popular liberty within its limits. Its influence on the general history of Europe ceased when the old empire was dissolved. In the new German empire it was too completely overshadowed by Prussia to have any objective importance by itself. Frederick lived 12 years after the division of his kingdom. The commercial and industrial interests of the country continued to be fostered, but only a few of the most unavoidable political reforms were granted. Religious equality was extended to the Reformed Church in 1818, and the separate diet of Upper Lusatia was abolished. Frederick Augustus was succeeded in 1827 by his brother Anthony who initiated a few unimportant reforms. An active opposition began to make itself evident in the diet and in the press, and in 1830, under the influence of the July revolution in Paris, riots broke out in Leipzig and Dresden, and a constitution was promised. After consultation with the diet the king promulgated, on Sept. 4, 1831, a new constitution by which the feudal estates were replaced by two chambers, largely elective, and the privy council by a responsible ministry of six departments.

While Saxony's political liberty was thus enlarged, its commerce and credit were stimulated by its adhesion to the Prussian *Zollverein* and by the construction of railways. Anthony had died in 1836, and Frederick Augustus II., since 1830 co-regent, became sole king. The burning questions were the publicity of legal proceedings and the freedom of the press; and on these the government sustained its first heavy defeat in the lower chamber in 1842. In 1843 the prime minister Lindenau was forced by the action of the aristocratic party to resign, and was replaced by Julius Traugott von Könneritz (1792–1866), a statesman of reactionary views. This increased the opposition of the Liberal middle classes to the Government. Religious considerations arising out of the attitude of the Government towards the "German Catholics," and a new constitution for the Protestant Church, began to mingle with purely political questions.

Warned by the sympathy excited in Saxony by the revolutionary events at Paris in 1848, the king dismissed his reactionary ministry, and a Liberal cabinet took its place in March 1848. The privileges of the nobles were curtailed; the administration of justice was put on a better footing; the press was unshackled; publicity in legal proceedings was granted; trial by jury was introduced for some special cases; and the German Catholics were recognized. The feudal character of the first chamber was abolished, and its members made mainly elective from among the highest tax-payers, while an almost universal suffrage was introduced for the second chamber. The first demand of the overwhelmingly democratic diet returned under this reform bill was that the king should accept the German constitution elaborated by the Frankfort parliament. Frederick, alleging the danger of acting without the concurrence of Prussia, refused, and dissolved the diet. The public demonstration at Dresden in favour of the Frankfort constitution was prohibited on May 2, 1849. The people seized the town and barricaded the streets; Dresden was almost destitute of troops; and the king fled to the Königstein. The rebels then appointed a provisional Government, consisting of Tzschirner, Heubner and Todt, though the

true leader of the insurrection was the Russian Bakunin. Meanwhile Prussian troops had arrived to aid the Government, and after two days' fierce street fighting the rising was quelled. The bond with Prussia now became closer, and Frederick entered with Prussia and Hanover into the temporary "alliance of the three kings"; but in 1850 he accepted the invitation of Austria to send deputies to the restored federal diet at Frankfort. The first chamber immediately protested against this step, and refused to consider the question of a pressing loan. The king retorted by dissolving the diet and summoning the old estates abolished in 1848. Beust became minister for both home and foreign affairs in 1852, and under his guidance the policy of Saxony became more and more hostile to Prussia and friendly to Austria.

The sudden death of the king in 1854 left the throne to his brother John whose name is known in German literature as a translator and annotator of Dante. His brother's ministers remained but their views gradually became somewhat liberalized with the spirit of the times. Beust, however, still retained his federalistic and philo-Austrian views. When war was declared between Prussia and Austria in 1866, Saxony took the side of Austria. On the conclusion of peace Saxony lost no territory, but had to pay a war indemnity of 10,000,000 thalers, and was compelled to enter the North German Confederation.

Franchise.—During the peace negotiations Beust had resigned and entered the Austrian service, and on Nov. 15 the king in his speech from the throne announced his intention of being faithful to the new Confederation as he had been to the old. On Feb. 7, 1867, a military convention was signed with Prussia which placed the army under the king of Prussia. The postal and telegraph systems were also placed under the control of Prussia, and the representation of the Saxon crown at foreign courts was merged in that of the Confederation. A new electoral law reformed the Saxon diet by abolishing the old distinction between the various "estates" and lowering the qualification for the franchise; the result was a Liberal majority in the lower house and a period of civil and ecclesiastical reform. John was succeeded in 1873 by his elder son Albert (1832–1902) who had added to his military reputation during the war of 1870. Under this prince the course of politics in Saxony presented little of general interest, except perhaps the spread of the doctrines of Social Democracy, which was especially remarkable in Saxony. The number of Social Democratic delegates in a diet of 80 members rose from 5 in 1885 to 14 in 1895. So alarming did the growth appear, that the other parties combined, and on March 28, 1896, a new electoral law was passed, introducing indirect election and a franchise based on a triple division of classes determined by the amount paid in direct taxation. This resulted in 1901 in the complete elimination of the Socialists from the diet. On June 7, 1902, King Albert died, and was succeeded by his brother as King George. An extraordinary situation had been created by the electoral law of 1896. This law had in effect secured the misrepresentation of the mass of the people in the diet, the representation of the country population at the expense of that of the towns, of the interests of agriculture as opposed to those of industry. The result was displayed in the elections of 1903 to the German imperial parliament, when, under the system of universal suffrage, of 23 members returned 22 were Social Democrats. This led to proposals for a slight modification in the franchise for the Saxon diet (1904), which were not accepted. In the elections of 1906, however, only 8 of the Social Democrats succeeded in retaining their seats. In 1907 the Government announced their intention of modifying the electoral system in Saxony by the adding of representation for certain professions to that of the three classes of the electorate. This was, however, far from satisfying the parties of the extreme Left, and the strength of Social Democracy in Saxony was even more strikingly displayed in 1909 when, in spite of plural voting, under a complicated franchise, 25 Socialist members were returned to the Saxon diet.

King George died on Oct. 15, 1904, and was succeeded by his son as King Frederick Augustus III., under whom the conflict about the constitution continued. The Left demanded a reform of the first chamber, the upper house, which should break the

predominance of the agrarians in that house and allow to commerce, industry and handicrafts a greater influence. This was reinforced in 1917 by the agitation of the extreme Left in the diet for the early conclusion of peace.

The Revolution.—On Oct. 26, 1918, the cabinet gave place to a more liberal government under Dr. Heinze. On Nov. 9, 1918, when the revolution broke out, King Frederick Augustus abdicated, and was later compensated by a grant of 300,000 marks. A new republican constitution was adopted on Nov. 1, 1920, but the revolutionary agitation remained active. Max Hölz, the most famous guerrilla leader of the communists, was at last defeated and captured early in 1921. In 1923 the strong revolutionary feeling of the Saxons was shown by the proceedings of the Zeigner ministry which depended upon an alliance of socialists and communists against the bourgeoisie and large capitalists. It was expelled from office by the reich government who occupied the country with troops and replaced the ministry by a conservative coalition. In 1924 Zeigner was condemned to three years' imprisonment on a charge of bribery and destroying official documents. The excesses of the communists and the violence of the conflicts in the alternating control by radicals and reactionaries for half a century in Saxony facilitated the seizure of power by the national socialists in 1933.

The chief authority for the early history of Saxony is Widukind, whose *Res gestae Saxonicae* is printed, together with the works of other chroniclers, in the *Monumenta Germaniae historica, Scriptores*. Collections which may be consulted are: *Codex diplomaticus Saxonie regiae* (Leipzig, 1862-79); the *Archiv für die sächsische Geschichte*, edited by K. von Weber (Leipzig, 1862-79); the *Bibliothek der sächsischen Geschichte und Landeskunde*, edited by G. Buchholz (Leipzig, 1903); and the *Bibliographie der Sächsischen Geschichte* (Leipzig, 1918, et seq., published by the *Sächsische Kommission für Geschichte*). See GERMANY, bibliography.

SAXONY, one of the provinces of Prussia, Germany, consists mainly of what was formerly the northern part of the kingdom of Saxony, which was ceded to Prussia in 1815, also comprises part of the former duchy of Magdeburg and other districts, the connection of which with Prussia is of earlier date. The area of the province is 9,860 sq.mi. For the former kingdom see the preceding article. It is bounded west by Hesse-Nassau, Hanover and Brunswick, north by Hanover and Brandenburg, east by Brandenburg and Silesia, and south by the *Länder* of Saxony and Thuringia. It is, however, very irregular in form, entirely surrounding parts of Brunswick and Thuringia, and itself possessing several exclaves, while the northern portion is almost severed from the southern by the *Land* of Anhalt.

The major part belongs to the great north-German plain, but the western and southwestern districts include parts of the Harz, with the Brocken, its highest summit, and of the Thuringian forest. About nine-tenths of Prussian Saxony belongs to the basin of the Elbe, the chief feeders of which within the province are the Saale, with its tributary the Unstrut, and the Mulde, but a small district on the west drains into the Weser.

Saxony is on the whole the most fertile province of Prussia and excels all the others in its produce of wheat and beetroot for sugar, but the nature of its soil is very unequal. The best crop-producing districts lie near the base of the Harz mountains, such as the "Magdeburger Börde" (between Magdeburg and the Saale) and the "Goldene Aue," and rich pasture lands occur in the river valleys, but the sandy plains of the Altmark, in the north part of the province, yield but a scanty return. Wheat and rye are exported in considerable quantities. The beetroot for sugar is grown chiefly in the district to the north of the Harz, as far as the Ohre, and on the banks of the Saale; and the amount of sugar produced is nearly as much as that of all the rest of Prussia together. Flax, hops and oilseeds are also cultivated, and large quantities of excellent fruit are grown at the foot of the Harz and in the valleys of the Unstrut and the Saale. The market gardening of Erfurt and Quedlinburg is well known throughout Germany. The province is comparatively poor in timber, though there are some fine forests in the Harz and other hilly districts. Cattle raising is carried on with success in the river valleys, and more goats are met with here than in any other part of Prussia.

The chief rock-salt mines and brine springs are at Stassfurt,

Schönebeck and Halle; potash is mined at Stassfurt (*q.v.*). Lignite deposits extend from Oschersleben by Kalbe to Weissenfels; lignite is also found in the neighbourhood of Aschersleben, Bitterfeld and Wittenberg. The copper mines are found chiefly in the Harz district. The other mineral resources include silver, pit-coal, pyrites, alum, plaster of Paris, sulphur, alabaster and good building-stone. Lignite of the Leuna district produces hydroelectric power, gasoline and other "substitute" products. In addition to the production of sugar the most important industries are the manufactures of cloth, leather, iron and steel wares, chiefly at Erfurt, Suhl and Sömmerda, spirits at Nordhausen, chemicals at Stassfurt and Schönebeck, and starch. Beer is also brewed extensively. Trade is facilitated by the great waterway of the Elbe as well as by a complete system of railways. The chief articles are wool, grain, sugar, salt, lignite and the principal manufactured products named above.

The population of the province of Saxony in 1939 was 3,622,594, an average of 367 persons to the square mile. The bulk of the inhabitants are of unmixed German stock, but many of those in the east part have Wendish blood in their veins.

Prussian Saxony is divided into the three government districts of Magdeburg, Merseburg and Erfurt. The principal towns are Magdeburg, Halle, Erfurt, Halberstadt, Nordhausen, Mühlhausen, Aschersleben, Weissenfels and Zeitz. The university of Halle attained high rank among German seats of learning.

SAXOPHONE, a modern hybrid musical instrument invented by Adolphe Sax, having the clarinet mouthpiece with single reed applied to a conical brass tube. In general appearance the saxophone resembles the bass clarinet, but the tube of the latter is cylindrical and of wood; both instruments are doubled up near the bell, which is shaped somewhat like the flower of the gloxinia. The mouthpiece in both is fixed to a curved tube at right angles to the main bore. In the case of the saxophone, however, owing to its conical bore, the quality of tone materially differs from that of the clarinet. The reed mouthpiece in combination with a conical tube allows the performer to give the ordinary harmonic series unbroken, which means in practice that the octave or second member of the harmonic series is first overblown. The saxophone is therefore one of the class known as octave instruments. The fundamental note given out by the tube when the lateral holes are closed is that of an open organ pipe of the same length, whereas when, as in the clarinet family, the reed mouthpiece is combined with a cylindrical bore, the tube behaves as though it were closed at one end, and its notes are an octave lower in pitch. Hence the bass clarinet to give the same note as a bass saxophone would need to be only half as long. The quality of tone of this family of instruments is inferior to that of the clarinets and has affinities with that of the harmonium. According to Berlioz it had kinship also with the timbre of the 'cello and cor anglais, with, however, a brazen tinge. The saxophone has not enjoyed much favour hitherto with high-class composers, though Richard Strauss scored for a quartet of the instruments in his *Sinfonia Domestica*. In military bands, however, it has proved of great service and it has acquired vogue as a leading member of the jazz orchestra.

SAY, JEAN BAPTISTE (1767-1832), French economist, was born at Lyons, on Jan. 5, 1767, of a Protestant family, who had fled from France after the revocation of the Edict of Nantes, but had returned in the 18th century. Intending to follow a commercial career, Say first entered the house of an English merchant, and was later employed in the office of a life assurance company in France. His attention having been called to *The Wealth of Nations*, however, he began to study economics, and in 1789 published his first pamphlet. In 1803 he published his principal work *Traité d'économie politique*. His views being displeasing to Napoleon, he was dismissed from the post of tribune, to which he had been elected in 1799. He built a spinning mill, and devoted himself to the industry and to the revision of his book, of which the second edition appeared in 1814. In the same year he was sent by the French government to study the economic conditions of Great Britain. The results of his observations appeared in a tract, *De l'Angleterre et des Anglais*, and in the corrected edition of the *Traité* (1817). A chair of industrial economy

was founded for him in 1819 at the Conservatoire des Arts et Métiers. In 1831 he was made professor of political economy at the Collège de France, and in 1828–30 he published his *Cours complet d'économie politique pratique*. At the revolution of 1830 he was named a member of the council-general of the department of the Seine, but resigned. He died at Paris on Nov. 15, 1832.

Say's writings occupy vols. ix–xii of Guillaumin's *Collection des principaux économistes*. Among them are *Olbie, où essai sur les moyens de réformer les moeurs d'une nation* (1800); *Catéchisme d'économie politique* (1815); *Petit Volume contenant quelques aperçus des hommes et de la société, lettres à Malibius sur différents sujets d'économie politique* (1820); *Épitomé des principes de l'économie politique* (1831). A volume of *Mélanges et correspondance* was published posthumously by his son-in-law, Chas. Comte, author of the *Traité de législation*.

The last edition of the *Traité d'économie politique* which appeared during the life of the author was the 5th (1826); the 6th, with the author's final corrections, was edited by the eldest son, Horace Emile Say, himself known as an economist, in 1846. The work was translated into English by C. R. Prinsep (1821), and into German, by C. Ed. Morstadt (1818 and 1830). See also A. Liesse, *Jean Baptiste Say* (Paris, 1901); E. Teilhac, *L'œuvre économique de Jean-Baptiste Say* (Paris, 1927).

SAY, JEAN BAPTISTE LÉON (1826–1896), French statesman and economist, the grandson of J. B. Say (*q.v.*) and the son of Horace Émile Say (1794–1860), was born in Paris on June 6, 1826. Descended from a long line of distinguished economists, Léon Say established his reputation by his brilliant criticisms of Haussmann's financial administration of the Seine, published in the *Journal des Débats* of which he was one of the proprietors. On taking his seat in the Assembly of 1871 for the Seine, he was chosen as reporter of a commission on the state of the national finances. The statements which he published attracting the attention of Thiers he appointed Say prefect of the Seine (June 5), and in December 1872 promoted him minister of finance. This was a remarkable tribute from Thiers, who, as a protectionist, was opposed to Say's free trade views. After the fall of Thiers (May 1873), Say held office in the Buffet ministry, although in profound disagreement with its leaders, and was minister of finance under Dufaure and Jules Simon, in the Dufaure ministry of Dec. 1877, and in the Waddington ministry till Dec. 1879. During this period, in which he was practically the autocratic ruler of the French finances, he directed the payment of the war indemnity with consummate skill, completing it long before the prescribed time.

Say's general financial policy was to ameliorate the incidence of taxation and to enrich the country, and therefore the Treasury, by removing all restrictions on internal commerce. He accordingly reduced the rate of postage, repealed the duties on many articles of prime utility, such as paper, and fought strongly, though unsuccessfully, against the system of *octrois*. In 1880 he visited England to negotiate a commercial treaty between France and England, but the presidency of the Senate falling vacant, he was elected to it on May 25, having meanwhile secured a preliminary understanding. In Jan. 1882 he became minister of finance in the Freycinet cabinet, which was defeated in the following July on the Egyptian question. Say's influence waned before the attacks of Socialism and the revival of protectionism, against which Say vainly organized the *Ligue contre le renchérissement du pain*. He had, however, a large share in the successful opposition to the income-tax. In 1889 he quitted the Senate to enter the Chamber as member for Pau, in the belief that his efforts for Liberalism were more urgently needed in the popular assembly. Throughout his career he was an indefatigable writer and lecturer on economics, and in both capacities exerted a wide influence. Special mention must be made of his work, as editor and contributor, on the *Dictionnaire des finances* and *Nouveau Dictionnaire d'économie politique*.

Say's style was easy and lucid, and he was often employed in drawing up important official documents, such as the famous presidential message of Dec. 1877. He was for many years a prominent member of the Académie des Sciences Morales et Politiques, and in 1886 succeeded to Edmond About's seat in the Académie Française. He died in Paris on April 21, 1896. A selection of his most important writings and speeches was later published in four volumes under the title of *Les Finances*

de la France sous la troisième république (1898–1901).

See J. Figard, *Lendemains financiers d'une guerre, Leon Say, ministre des finances après 1870–71* (Paris, 1915); Georges Michel, *Leon Say* (Paris, 1900); Georges Picot, *Leon Say, notice historique* (Paris, 1901).

SAY, a town on the right bank of the river Niger in 13° 4' N. and 2° 30' E. In the agreement of 1890 between Great Britain and France for the delimitation of their respective spheres of influence in West Africa, Say was taken as the western end of an imaginary line which ran eastward to Barrua on Lake Chad. By the convention of 1898 Say and a considerable tract of territory south and east of the town were ceded to France. The district of Say covers 7,143 sq.mi. and has 69,000 inhabitants; after having formed part of the colony of the Upper Volta, it was again attached in 1927 to that of Niger.

SAYAD, a descendant of Ali, the son-in-law of Mohammed, by Fatima, Mohammed's daughter. Many of the Pathan tribes in the North-West Frontier Province of India, such as the Bangash of Kchat and the Mishwanis of the Hazara border, claim Sayad origin. The apostles who completed the conversion of the Pathans to Islam were called Sayads if they came from the west, and Sheikhs if they came from the east; hence doubtless many false claims to Sayad origin. In Afghanistan the Sayads have much of the commerce in their hands, as their holy character allows them to pass unharmed where other Pathans would be murdered.

The Sayads reigned at Delhi during the first half of the 15th century. Their name again figures in Indian history at the break-up of the Mogul empire, when two Sayad brothers created and dethroned emperors at their will (1714–1720).

SAYAN MOUNTAINS, in central Asia, forming the eastern continuation of the Sailughem or Altai range, stretching from 89° E. to 106° E. They are the border-ridge between the plateau of N.W. Mongolia and Siberia. The geology is imperfectly known; the mountains are of the Hercynian age. The general elevation is 7,000 to 9,000 ft.; peaks, consisting largely of granites and metamorphic rocks, reach 10,000 ft. and 11,450 ft., e.g., in Munko Sardyk; and the principal passes lie at 6,000 to 7,500 ft. above the sea, e.g., Muzaugh 7,480 ft., Mongol 6,500 ft., Tenghyz 7,480 ft. and Obo-sarym 6,100 ft. In 92° E. the system is pierced by the Bei-kem or upper Yenisei, and in 106° E., it terminates above the depression of the Selenga-Orkhon valley. From the Mongolian plateau the ascent is gentle, but from the plains of Siberia it is much steeper, despite the fact that the range is masked by a broad belt of subsidiary ranges, e.g., the Usinsk, Oya, Tunkun, Kitoe and Byelaya ranges. Between the breach of the Yenisei and the Kosso-gol (lake) in 100° 30' E. the system bears also the name of Yerghik-taiga. The higher regions carry good forests of larch, pitch pine, cedar, birch and alder, with rhododendrons and species of *Berberis* and *Ribes*. Lichens and mosses clothe many of the boulders that are scattered over the upper slopes.

SAYBROOK, OLD, a town of Middlesex county, Connecticut, U.S.A., on Long Island sound, at the mouth of the Connecticut river; served by the New York, New Haven and Hartford railroad and the New Haven and Shore Line railway buses. Pop. (1950) 2,499. Fenwick is the borough of the town. Originally known as Saybrook, the town became Old Saybrook July 8, 1854, when the village of Deep River, farther inland, became the town of Saybrook and retained the ancient records. In 1947 Deep River dropped the name of Saybrook altogether, although retaining the Saybrook records.

The village of Potopaug was subsequently lost to the original town also and became the town of Essex. In 1623 a small Dutch party settled there but did not long remain. John Winthrop headed a force settling there in 1635, forestalling by a few weeks a second Dutch attempt to settle in Saybrook.

The largest shareholders in the company holding the land grant were Lord Saye and Sele and Lord Brooke, and a combination of the names of these two proprietors became the name of the town. The Collegiate School of Connecticut, which was established there in 1701, and which moved to New Haven in 1716, was the foundation of Yale university. Old Saybrook was the home of David Bushnell (1742–1824) who, in 1776 devised a submarine

torpedo and a tortoise-shaped diving boat ("the American turtle") which were tried against the British without success in the American Revolution. In 1644 the proprietors' rights to the town were sold to Connecticut.

SAYCE, ARCHIBALD HENRY (1845–1933), British Orientalist, was born at Shirehampton on Sept. 25, 1845, son of the Rev. H. S. Sayce, vicar of Caldicot. He was educated at Bath, and at Queen's college, Oxford, becoming a fellow in 1869. From 1891 to 1919 he was professor of Assyriology at Oxford. Although his conclusions have been modified (e.g., in chronology and transliteration) by the work of other scholars (see, e.g., BABYLONIA AND ASSYRIA), it is impossible to overestimate his services to Oriental scholarship. He travelled widely in the East. There has been a strong tendency to revert to the views which he advanced on the question of the Hittites in his early Oxford lectures. He was a member of the Old Testament Revision company (1874–84); deputy professor of comparative philology in Oxford (1876–90); Hibbert lecturer (1887); Gifford lecturer (1900–02).

Among his more important works are: *Assyrian Grammar for Comparative Purposes* (1872); *Principles of Comparative Philology* (1874); *Babylonian Literature* (1877); *Introduction to the Science of Language* (1879); *Monuments of the Hittites* (1881); *Herodotus i–iii.* (1883); *Patriarchal Palestine* (1895); *The Egypt of the Hebrews and Herodotus* (1895); *Early History of the Hebrews* (1897); *Israel and the Surrounding Nations* (1898); *Babylonians and Assyrians* (1900); *Egyptian and Babylonian Religion* (1903); *Archaeology of the Cuneiform Inscr.* (1907). He also contributed important articles to the 9th, 10th and 11th editions of the *Encyclopædia Britannica* and edited a number of Oriental works. See also his *Reminiscences* (1923).

SAYE AND SELE, WILLIAM FIENNES, 1ST VISCOUNT (1582–1662), was the only son of Richard Fiennes, 7th Baron Saye and Sele, and was descended from James Fiennes, Lord Saye and Sele, who was lord chamberlain and lord treasurer under Henry VI, and was beheaded by the rebels under Jack Cade on July 4, 1450. Fiennes was educated at New College, Oxford; he succeeded to his father's barony in 1613, and in parliament opposed the policy of James I., undergoing a brief imprisonment for objecting to a benevolence in 1622, and he showed great animus against Lord Bacon. In 1624, he was advanced to the rank of a viscount. In the early parliaments of Charles I. he was in Clarendon's words "the oracle of those who were called Puritans in the worst sense, and steered all their counsels and designs." His energies found a new outlet in helping to colonize Providence Island, and in interesting himself in other and similar enterprises in America. Although Saye resisted the levy of ship-money, he accompanied Charles on his march against the Scots in 1639; but, with only one other peer, he refused to take the oath binding him to fight for the king to "the utmost of my power and hazard of my life." When the Civil War broke out, however, Saye was on the committee of safety, was made lord-lieutenant of Gloucestershire, Oxfordshire and Cheshire, and, raising a regiment, occupied Oxford. He was a member of the committee of both kingdoms; was mainly responsible for passing the self-denying ordinance through the House of Lords; and in 1647 stood up for the army in its struggle with the parliament. In 1648, both at the treaty of Newport and elsewhere, Saye was anxious that Charles should come to terms, and he retired into private life after the execution of the king, becoming a privy councillor again upon the restoration of Charles II. He died at his residence, Broughton Castle near Banbury, on April 14, 1662. On several occasions Saye outwitted the advisers of Charles I. by his strict compliance with legal forms. He was a thorough aristocrat, and his ideas for the government of colonies in America included the establishment of an hereditary aristocracy. Old Saybrook (*q.v.*) in Connecticut is named after Viscount Saye and Lord Brooke.

SAYERS, TOM (1826–1865), English pugilist, was born at Brighton on May 25, 1826. By trade a bricklayer, he began his career as a prize fighter in 1849 and won battle after battle, his single defeat being at the hands of Nat Langham in Oct. 1853. In 1857 he gained the championship. His fight with the American, John C. Heenan, the Benicia Boy, a much heavier man than himself, is perhaps the most famous in the history of the English prize ring. It took place at Farnborough on April 17, 1860, and lasted 2 hr. 6 min., 37 rounds being fought. After Sayers's right

arm had been injured the crowd pressed into the ring and the fight was declared a draw; £3,000 was raised by public subscription for Sayers, who withdrew from the ring. He died on Nov. 8, 1865. The champion was 5 ft. 8½ in. in height and his fighting weight was under 155 pounds. An account of the fight between Sayers and Heenan is given by Frederick Locker-Lampson in *My Confidences* (1896).

SAYRE, a borough of Bradford county, Pennsylvania, U.S.A., on the Susquehanna river near the mouth of the Chemung, 17 mi. S.E. of Elmira and just south of the New York state line. It is served by the Lehigh Valley railroad and motorbus lines. Population (1950) 7,735; 1940, federal census 7,569. Adjoining Sayre are the Pennsylvania boroughs of Athens and South Waverly (4,430 and 1,298 respectively in 1950) and the New York village of Waverly (*q.v.*); the four municipalities are practically one industrial community. Sayre was founded in 1880 and incorporated in 1891. It was named for Robert Heysham Sayre (1824–1907), chief engineer of the railroad. Robert Packer hospital and the Guthrie clinic are located there.

SAYYID AHMAD KHAN, SIR (1817–1898), Mohammedan educationist and reformer, was born at Delhi, India, in 1817. He belonged to a family which had come to India with the Mohammedan conquest, and had held important offices under the Mogul emperors. Although his imperfect acquaintance with English prevented his attainment of higher office than that of a judge of a small cause court, he earned the title of the recognized leader of the Mohammedan community. To the British he rendered loyal service, and when the mutiny reached Bijnor in Rohilkand in May 1857 the British residents owed their lives to his courage and tact. Sayyid Ahmad established a translation society, which became the Scientific Society of Aligarh, and encouraged the study of western life and letters. In 1873 he founded the Mohammedan Anglo-Oriental College at Aligarh. He stimulated a similar educational activities in Karachi, Bombay and Hyderabad. Thus he effected a revolution in the attitude of Mohammedans towards modern education. He was made K.C.S.I. and became a member of the legislative councils of India and Allahabad, and of the education commission. He died at Aligarh on March 2, 1898.

See Lieut.-Colonel G. F. I. Graham, *The Life and Work of Sir Sayyid Ahmed Khan* (1885).

SAZONOV, SERGHEI DMITRIEVICH (1866–1927), Russian statesman, was born in the province of Ryazan, July 29, 1866, the son of a landed proprietor, and educated at the Alexandrovsky Lyceum, St. Petersburg (Leningrad), a high school for the sons of noblemen destined mainly for the civil service. Having occupied various diplomatic posts in Rome and served six years in the Russian Embassy in London he was promoted, in 1906, to be Minister-Resident at the Vatican, where his engaging manners, frankness and taste for ecclesiastical affairs enabled him to make great headway. In 1909 he entered the Ministry of Foreign Affairs as coadjutor to Izvolsky, whom he succeeded as Minister in 1910—an appointment ascribed to the influence of his brother-in-law, Stolypin.

Sazonov's line of action was definitely traced for him by the European situation on the one hand and by the limitation of his rôle to that of confidential secretary to the Emperor on the other. His chief functions were to parry Austria's fitful thrusts at Serbia, to curb Serbia's explosive impatience, buoying her up with hopes of a vast legacy to fall due on the death of the Emperor Francis Joseph, and to bespeak the help of England, Italy, Rumania (to whom he also held out hopes of a legacy) and Bulgaria in the coming struggle. These tasks exceeded his powers, and his abortive Near-Eastern policy did not prevent Russia's ruinous collapse during World War I. Yet if his work was not to prove permanent he carried it out with considerable skill, and defended himself ably in his memoirs against the charge that he was seeking to precipitate a World War; although he admitted knowledge of the fact that Hartwig, in Belgrade, was working against his avowed aims. Meanwhile, Sazonov genuinely worked for present peace, to gain time for Stolypin's far-reaching domestic reforms and to allow Russia to consolidate her insecure

domestic and military situation.

The arrangements come to during the Tsar's visit to Potsdam (Nov. 4–5 1910) and the Kaiser's return visit to Wolfsgraben (Nov. 11) respecting the Baghdad railway, North Persia and the maintenance of Turkey, eased the strain, but failed to dispel the atmosphere of mistrust. Sazonov was suspected of a lack of straightforwardness by the Kaiser. Russia's diplomatic representatives abroad were largely to blame for this, and in particular the rashness or awkwardness of ambassador Charykov in Constantinople, who secretly proposed to guarantee that city to Turkey and protect her from all attacks by the Balkan States in return for the freedom of the Straits. Other covert moves also lent colour to the charges of underhand dealing. For example, on the conclusion of the Balkan Alliance of 1912, Sazonov decided to seek Germany's help in overawing the Balkan States and thus preserving peace. He accordingly arranged an interview between the Tsar and the Kaiser at Baltischport on July 4–5 1912, which was followed by a three days' exchange of views between the German Chancellor and the members of the Russian Govt. in St. Petersburg. Yet he concealed from Germany the existence of the Balkan Alliance which had been communicated to him. Sazonov next repaired to London, Paris and Berlin and the Great Powers authorised him and Berchtold to announce their determination to uphold the *status quo*, so that if the Balkan States broke the peace their victory would be fruitless. The veto was successfully ignored by the Balkan Powers, and a European crisis was the result. Sazonov, on this occasion, behaved with moderation. He kept a tight hand on Serbia, obliged her to content herself with a railway harbour on the Albanian coast, a railway connection and the secret assurance that her "promised land" lay within the dual monarchy.

He was next employed in drafting, in collaboration with Bethmann Hollweg, a scheme of reforms for Armenia (Nov. 5, 1913). Immediately afterwards, a fresh conflict with Germany arose over the despatch of General Liman von Sanders to Constantinople. Sazonov gave vent to his dissatisfaction in unusually strong terms, but on the Kaiser ordering Liman to lay down the command of the first Turkish army corps, while retaining his other functions, Nicholas II. let the matter drop. Sazonov then drafted a memorandum to the Tsar on Russia's claim to the freedom of the Straits (Nov. 1913) and three months later (Feb. 21, 1914) convened a council of political and military experts to discuss the ways and means of realising the scheme in case of a European war. But the military experts announced that in the plans of campaign no such side-problems could be included.

On learning of the delivery of the Austro-Hungarian ultimatum to Serbia on July 24, 1914, Sazonov appealed unsuccessfully to Austria to extend the time limit, and advised Serbia to accept all demands except those concerning the sovereign rights of Serbia. Meanwhile, Russia adopted the military measures known as "pre-mobilisation" (July 25), the Tsar and Sazonov planning a partial mobilisation to follow in case Serbia should be attacked. But the General Staff objected that it had no plan ready for a transition from partial to general mobilisation, and that as war seemed unavoidable the latter was imperative. Sazonov still insisted on waiting; meanwhile Berchtold declared war against Serbia (July 28), whereupon Sazonov (in the night of July 28–29) advised the Tsar to sign the order.

A belated telegram, however, from the Kaiser adjuring him to preserve peace for the sake of the monarchic principle moved the Tsar to withdraw the order for general, and substitute that for partial, mobilisation. This command was obeyed in words but the military experts having convinced Sazonov that it would be suicidal, the Minister next morning (July 30) presented himself to the Tsar and obtained his consent to the radical measure advocated by the General Staff. On the following morning this order was posted up in St. Petersburg and the catastrophe, already inevitable, broke loose.

During the War Sazonov countered all influences tending to the abandonment of the struggle by Russia, but he followed the Tsar's lead in demanding first the opening of the Straits and the internationalisation of Constantinople and later on the annexa-

tion of the Turkish capital. The hostility of Turkey and Bulgaria impeded assistance from the Allies, whereupon Sazonov made a bid for the help of the Poles in the shape of a Home Rule scheme, but the proposal was scouted in Court circles and he was dismissed from his post. Thus ended his career. His fall was gently broken by his appointment as Ambassador to Great Britain, but before he reached his destination the revolution of March 1917 had deposed the Tsar. Sazonov, however, was willing to represent the Government that had thrust aside his imperial master but it too was suddenly swept away. He was next appointed Minister for Foreign Affairs by Admiral Kolchak; but after 1920 he retired into private life, settling at Versailles, where he occupied himself in writing his memoirs. These appeared in English in 1928 under the title "Fateful Years." They were attacked, especially in Germany, on the ground of insincerity. (See the work *Rings um Sazonov*: 1928.) Sazonov died at Nice, Dec. 23, 1927.

SBEITLA (anc. *Sufetula*), a ruined city of Tunisia, 66 m. S.W. of Kairawan. The chief ruin is the Forum, 238 ft. by 198 ft., having three small and one large entrance. The great gateway is a fine monumental arch in fair preservation, with an inscription to Antoninus Pius. Facing the arch, their rear walls forming one side of the enclosure, are three temples, connected with one another by arches, and forming one design. The length of the entire façade is 118 ft. The principal chamber of the central temple, which is of the Composite order, is 44 ft. long; those of the side temples, in the Corinthian style, are smaller. The walls of the middle temple are ornamented with engaged columns; those of the other buildings with pilasters. The porticos have been repaired, and run round the other three sides of the enclosure, which is still partly paved. The other ruins include baths, remains of a theatre, an amphitheatre, a triumphal arch of Diocletian, two churches of the priest Servas and the bishop Bellator, a chapel of the bishop Jucundus (411–419), a still serviceable bridge which also carried an aqueduct, and several square Byzantine forts.

The early history of Sufetula is preserved only in certain inscriptions. Under Antoninus and Marcus Aurelius it was a flourishing city, the district, now desolate, being then very fertile and covered with forests of olives. It was partly rebuilt during the Byzantine occupation and became a centre of Christianity. At the Arab invasion it was the capital of the exarch Gregorius.

See A. Merlin, *Forum et églises de Sufetula* (1912).

SCABIES or **ITCH**, a skin disease due to an animal parasite, the *Acarus* or *Sarcoptes scabiei* (see MITE), which burrows under the epidermis at any part of the body, but hardly ever in the face or scalp of adults; it usually begins at the clefts of the fingers, where its presence may be inferred from several scattered pimples, which will probably have been torn at their summits by the scratching of the patient, or have been otherwise converted into vesicles or pustules. The remedy is soap and water, and sulphur ointment.

SCABIOUS, the common name for several European flowers. The common or field scabious (*Scabiosa arvensis*) and the devil's-bit scabious (*Succisa pratensis*) belong to the teazel family (Dipsacaceae). The flowers are aggregated together to form a head. The sheep's-bit scabious (*Jasione perennis*) belongs to the bell-flower family (Campanulaceae) and is a quite different plant. It resembles the common scabious, however, in having the flowers aggregated together into a head.

SCAEVOLA, the name of a famous family of ancient Rome, the most important members of which were:—

1. **GAIUS MUCIUS SCAEVOLA**, a legendary hero, who volunteered to assassinate Lars Porsena when he was besieging Rome. He reached Porsena's tent, but slew his secretary by mistake. Before the royal tribunal Mucius declared that he was one of 300 noble youths who had sworn to take the king's life, and that he had been chosen by lot to make the attempt first. Threatened with death or torture, Mucius thrust his right hand into the fire blazing upon an altar, and held it there until it was consumed. The king, deeply impressed and dreading a further attempt upon his life, ordered Mucius to be liberated, made peace with the Romans and withdrew his forces. Mucius was rewarded with a grant of land beyond

the Tiber, known as the "Mucia Prata" in the time of Dionysius of Halicarnassus, and received the name of Scaevela ("left-handed"). The story is presumably an attempt to explain the name Scaevela (Livy ii. 12; Dion. Halic. v. 27–30). The Mucius of the legend is described as a patrician; the following were undoubtedly plebeians.

2. **PUBLIUS MUCIUS SCAEVOLA**, Roman orator and jurist, consul 133 B.C. during the time of the Gracchan disturbances. He was not opposed to moderate reforms, and refused to use violence against Tiberius Gracchus. After the murder of Gracchus, however, he expressed his approval of the act. He was an opponent of the younger Scipio Africanus, for which he was attacked by the satirist Lucilius (Persius i. 115; Juvenal i. 154). In 130 he succeeded his brother Mucianus as *pontifex maximus*. During his tenure of office he published a digest in 80 books of the official annals kept by himself and his predecessors. Cicero frequently mentions him as a lawyer of repute, and he is cited several times in the Digest. He was also a famous player at ball and the game called Duodecim Scripta; after he had lost a game, he was able to recall the moves and throws in their order.

See A. H. J. Greenidge, *History of Rome*.

3. **QUINTUS MUCIUS SCAEVOLA**, son of (2), usually called "*Pontifex Maximus*," to distinguish him from (4), consul in 95 B.C. with L. Licinius Crassus the orator. He and his colleague brought forward the *lex Licinia Mucia de civibus regundis* which closed Roman citizenship to the allies in future, and was largely responsible for the Social War. After his consulship Scaevela was governor of the province of Asia, and dealt severely with the tax-farmers. In honour of his memory the Greeks of Asia set aside a day for the celebration of festivities and games called Mucia. He was subsequently appointed *Pontifex Maximus*, and, in accordance with custom, dispensed free legal advice, which was extensively sought, even by men of the standing of Servius Sulpicius. He regulated the priestly colleges, and insisted on observance of the traditional ritual, though he himself believed that religion was only for the uneducated. He was proscribed by the Marian party, and in 82, when the younger Marius, after his defeat by Sulla at Sacriportus, gave orders for the evacuation of Rome and the massacre of the chief men of the opposite party, Scaevela, while attempting to reconcile the opposing factions, was slain at the altar of Vesta and his body thrown into the Tiber. He had already escaped an attempt made upon his life by Gaius Fimbria at the funeral of the elder Marius in 86.

Scaevela was the founder of the scientific study of Roman law and the author of a systematic treatise on the subject, in eighteen books, frequently quoted and followed by subsequent writers. It was a compilation of legislative enactments, judicial precedents and authorities, from older collections, partly also from oral tradition. A small handbook called "*Opo (Definitions)*" is the oldest work from which any excerpts are made in the *Digest*, and the first example of a special kind of judicial literature (*libri definitionum or regularum*). It consisted of short rules of law and explanations of legal terms and phrases. A number of speeches by him, praised by Cicero for their elegance of diction, were in existence in ancient times.

4. **QUINTUS MUCIUS SCAEVOLA** (c. 159–88 B.C.), uncle of (3), from whom he is distinguished by the appellation of "Augur." He was instructed in law by his father, and in philosophy by the Stoic Panaetius of Rhodes. In 121 he was governor of Asia. Accused of extortion on his return, he defended himself successfully. In 117 he was consul. He was a great authority on law, and at an advanced age he gave instruction to Cicero and Atticus. He had a high appreciation of Marius, and refused to vote for Sulla's motion declaring him a public enemy. Scaevela is one of the interlocutors in Cicero's *De oratore*, *De amicitia* and *De republica*.

For the legal importance of the Scaevelas, see A. Schneider, *Die drei Scaevela Ciceros* (Munich, 1879), with full references to ancient and modern authorities.

SCAFELL (pronounced and sometimes written Scaw Fell), a mountain of Cumberland, England, in the Lake District. The name is specially applied to the southern point (3,162 ft. in height) of a certain range or mass, but Scafell Pike, separated from Scafell by the steep narrow ridge of Mickledore, is the highest point in England (3,210 ft.). The ridge continues north-east to Great End (2,984 ft.), which falls abruptly to a flat terrace,

on which lies Sprinkling Tarn. The range thus defined may be termed the Scafell mass. North-west from the Pike the lesser height of Lingmell (2,649 ft.) is thrown out, and the steep flank of the range sweeps down to the head of Wasdale. On the east an even steeper wall, with splendid crags, falls to Eskdale. Above Mickledore ridge Scafell rises nearly sheer, with bold clefts.

SCAFFOLD or **SCAFFOLDING**, properly a platform or stage, particularly one of a temporary character erected for viewing or displaying some spectacle. The most general modern application of the word, however, refers to the temporary frames and platforms erected or suspended at convenient heights to afford easy access to work of construction and repair.

A scaffold, in its simplest form, may be a single plank supported by trestles, or it may be the extremely complicated construction necessary to render every part of a large cathedral or similar building accessible.

Up to a comparatively recent date scaffolds were invariably constructed of timbers bound together with ropes, but now many forms of patent scaffolding and fixing devices are available. The more general adoption of steel-framed buildings has contributed largely towards the development of *suspended scaffolding*. The steel members themselves, supplemented by ladders, provide the only scaffolding necessary in the erection of the frame, and since the steel work is practically completed before the wall filling and facing is commenced, it is more convenient and economical to suspend a single platform—that may extend along the whole face of the building if required, and capable of being raised as the work proceeds—from cantilevers fixed to the top members of the frame, than it is to erect a poled scaffold over the whole face of the building.

Timber Scaffolds.—The ordinary type of timber scaffolding comprises the following:—standards, ledgers, putlogs, braces, scaffold boards and lashings. The standards, ledgers and braces are usually tapering poles (the stripped trunks of young fir trees), about 15 to 35 ft. in length and 3½ to 5 in. in diameter at the butt.

The putlogs are of riven birch, 5 to 6 ft. long and 3 in. in section. Scaffold boards are of spruce, 8 to 12 ft. long, 9 in. wide by 1½ in. thick, with the ends bound by hoop iron to obtain strength and security. The ends of the hoop iron should be turned into saw cuts in the edges of the wood to prevent injury to the workmen while handling the boards.

Until recently the lashings were, in nearly every case, made of jute or hemp fibres, white Manila hemp being the best and strongest. Flexible wire cords are now used to a considerable extent for lashings. These cords are about ¼ in. in diameter and are sufficiently long for every form of scaffold junction. They are made of several strands of small gauge wire, one end of the cord being finished with a metal cap or sleeve to prevent the strands from spreading, the other end being turned around a metal eye piece and securely bound or spliced. Scaffold wedges are unnecessary with wire cords.

Chain ties and tightening blocks are frequently used in the place of cord lashings and require less time for fixing. Such a form of scaffold fixing was used in the scaffolding erected for the reconstruction of Buckingham palace, and in many other important works, and proved to be satisfactory.

Bricklayer's Scaffold.—In erecting a bricklayer's scaffold, the standards are placed upright at a distance of 5 ft. from the face of the wall and from 6 to 9 ft. apart; the lower ends of the standards being held in position by the method best suited to the nature of the site. Thus, the ends may be placed in barrels of earth or sand, they may be placed on a timber sole plate and held in position by nailed fillets; or they may be sunk a foot or two into the ground. The ledgers are fixed horizontally along the inner faces of the standards at vertical intervals of 5 feet. The putlogs are placed 3 or 4 ft. apart, perpendicular to the face of the wall, one end of each putlog resting on the ledger, the other end passing into a recess left, or made, in the wall for that purpose. The scaffold boards are laid on the putlogs and parallel to the face of the wall. At the position where the end joints between the boards occur, two putlogs are placed a few inches

SCAFFOLD

apart to obviate the necessity for lapping the ends of the boards.

Scaffolds of this type should always have diagonal braces fixed across the faces of the standards to avoid risk of failure by side racking, and the scaffold must be prevented from falling away from the face of the wall by ties or bridles through the window openings. The third possible cause of failure, the buckling of the standards, is guarded against in scaffolds supporting heavy loads by having the whole or lower part of the scaffold "double potted." All scaffolds should have guard planks and guard rails fixed to the outer standards.

As the work is carried up the boarding and many of the putlogs are removed to the stage above, some putlogs, however, being left tied to the lower ledgers to stiffen the scaffold. In the case of thick walls a scaffold is required inside as well as outside the building, and when this is the case the two structures are tied together and stiffened by short connecting poles through the window and door openings.

Mason's Scaffold.—The mason requires an independent scaffold. He may not rest the inner ends of his putlogs in the wall as the bricklayer does, for this would disfigure the stonework, hence another and parallel framework of standards and ledgers is placed within a few inches of the wall-face upon which to support them. The two portions are tied together with cross braces, and the whole of the timbering is made capable of taking heavier weights than are required in the case of the bricklayer.

Masons' scaffolds upon which banker work is done are usually of sawn material bolted together; the arrangement of the rectangular members corresponding to that in the ordinary type of scaffold.

Metal or Tubular Scaffold.—This type of scaffolding was used during the process of erection of Bush house, Aldwych, Devonshire house, Piccadilly and many other important buildings in London and the provinces, and must now be noticed in any reference work on scaffolding.

The special advantages claimed for tubular scaffolding are:—It is easily transported; since 12 feet is the maximum length of any member a great quantity may be stored in an ordinary truck. Its strength is beyond question, it is fireproof and practically indestructible. It is easily introduced into narrow or tortuous entrances, and may be erected with great rapidity and little labour. It is not affected by climatic conditions, is neat and compact when erected and is light and efficient for slung scaffolds.

Tubular scaffolding consists of sections of steel tubes, about 2 in. in diameter and of various lengths, with various forms of clips and couplings, base plates and patent putlogs.

The putlogs are of oak reinforced with steel, the steel projecting beyond the wood to allow it to be inserted and wedged into the brickwork joints when necessary. Thus putlog holes are not required to be left or made in the wall surfaces. The standards are not placed more than 8 feet apart for ordinary scaffolds, and not more than 6 feet apart for masons' scaffolds. The diagonal bracing is fixed by special swivel couplers.

Suspended Scaffolding.—Where the nature of the building will permit of its use suspended scaffolding has many very important advantages. Thus, in high steel framed buildings the lower floors may be occupied before the upper ones are completed. The scaffold platform may be kept at the position in which the work is always at bench height. The space immediately below the scaffold is clear of obstructions. The scaffold platform is flexible and its height may be varied along its length, within certain limits, to suit special conditions.

This form of scaffolding was used in Adelaide House, London, E.C.; the Lewis Building, Birmingham; Messrs. C. and A. Modes Ltd., Liverpool, and many other equally large and important buildings, and has proved to be safe, convenient and economical. The complete scaffold is made up of a number of units or sections.

Each section has a machine or winch at each corner, the supporting cables being wound or unwound about the machine drum by a device specially designed to ensure safety while raising or lowering the platform.

Gantries.—"Gantry" is the term applied to a staging of squared timber used for the easy transmission of heavy material. The

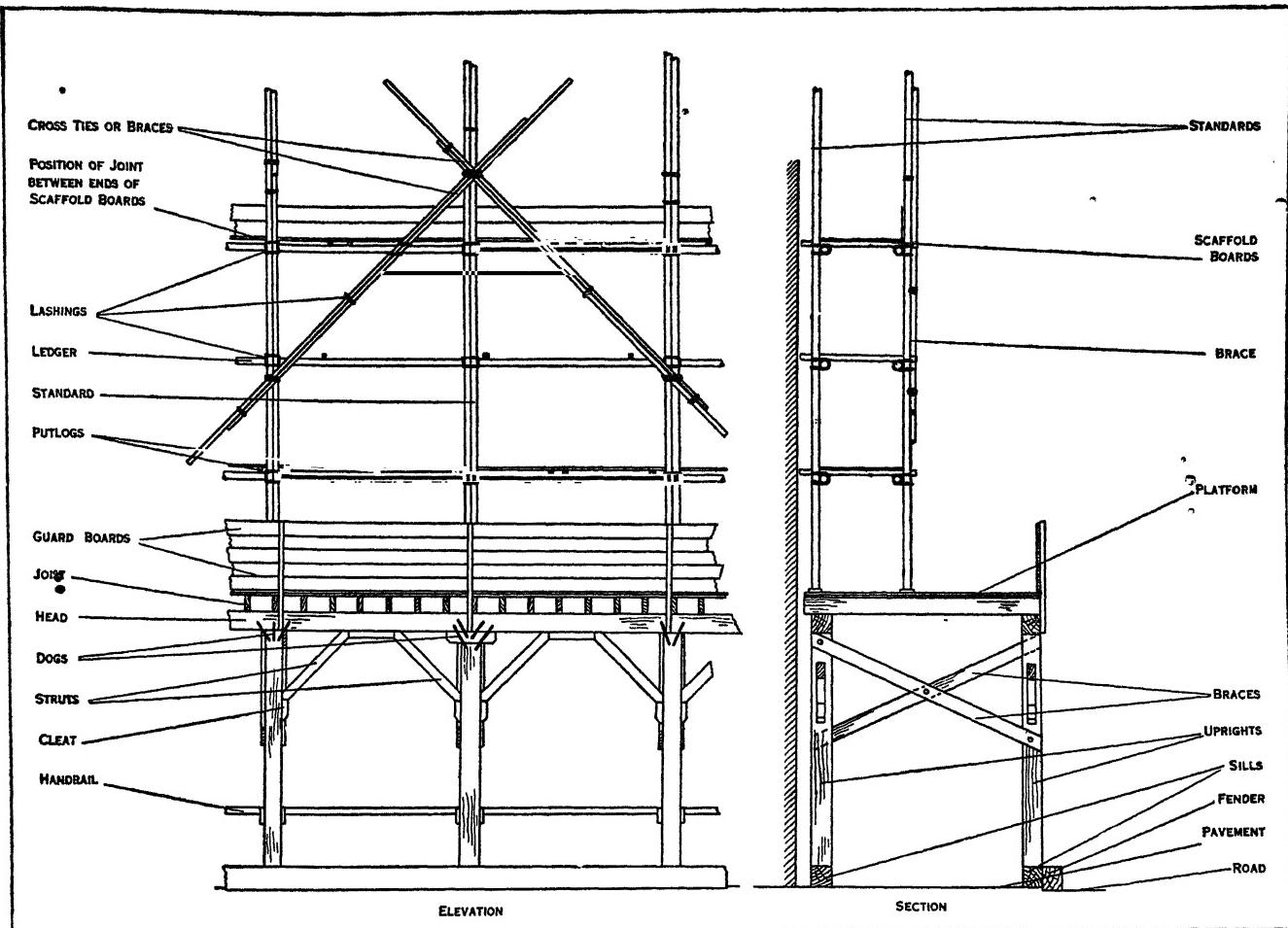
name has, however, come to be used generally for strong stagings of squared timber whether used for moving loads or not. Taking the general meaning of the term, gantries may be divided into three classes: (1) Gantries supporting a traveller; (2) Travelling gantries, in which the whole stage moves along rails placed on gantries, which to erect pole scaffolding.

The two former of this type of structure are now little used. Many more or less permanent timber gantries exist in goods yards and similar places but modern methods of handling and hoisting materials have rendered the old type of traveller gantry almost obsolete.

The form of fixed staging or platform gantry which is used over a public pavement is indispensable for conducting building operations in large towns where it is important to keep the footway in clear and to safeguard pedestrians who are using the footway in front of the building site. They consist of two sets of standards, sill and head, one set being erected close to the building and the other about 8 or 10 ft. away. These stages are formed of square timber, framed and braced in a similar manner to gantries or shored to support a traveller, but, instead of external shores or braces the uprights are braced across to each other, care being taken to fix the braces at such a height as to allow free passage beneath them. Joists are placed across from head to head, and a double layer of scaffold boards is laid to form the floor, the thickness being necessary to prevent materials dropping through the floor. When the gantry abuts the joints upon the heads of passers-by. When the gantry abuts on the road, a heavy timber fender splayed at each end should be placed so as to ward off the traffic. At the level of the platform a fanguard is often thrown out for a distance of about 6 ft. or more and closely boarded to protect the public from falling materials and the workmen from accident.

Derrick Towers.—Derrick "gantries" or "towers" are skeleton towers of heavy timbers erected in a central position on a site to support a platform at such a height as to enable an electric or steam power derrick crane placed upon it to clear the highest portions of the building. The crane revolves upon a base through nearly three parts of the circumference of a circle, and in addition to this the jib of the crane is capable of an "up and down" motion which enables it to command any spot within a radius of three-quarters of the length of the jib. For a single crane, a derrick tower with three legs is built, and the crane is placed over one of these, stayed back to the other two and then counterbalanced by heavy weights. Each leg is usually from 6 ft. to 10 ft. square on plan, the "king" leg (that is, the leg supporting the crane) being larger than the "queen" legs. The three legs are placed from 20 to 30 ft. apart in the form of an equilateral or isosceles triangle. When two cranes are used, as is the case when important operations are to be conducted over the entire area of a circle, a four-legged square derrick tower is constructed, and a crane set upon a platform over each of two opposite legs. The ground upon which it is proposed to erect the towers must be well chosen for its solidity, or specially prepared to receive the towers. The foundation usually consists of a platform of 9-in. by 3-in. deals under each leg. The corner posts may be of three 9-in. by 3-in. deals bolted together, but those for the king leg may advantageously be larger. They are connected at every 8 or 10 ft. of their height by means of cross pieces or transoms from 7" by 2" to 9" by 3" in size, and each bay thus formed is filled in on all four sides with extra timber to take the weight of the crane. It may be a balk of whole timber, 12 or 14 in. square, or may consist of deals bolted together up to 16 in. square. This central member must be well braced and strutted from the four corners to resist any tendency to bending.

When the towers have reached the desired height the king leg is connected to each of the queen legs by a trussed girder; the two queen legs may be connected with each other either by a similar trussed girder or by a single timber which is supported by struts from the supporting legs to shorten the span and give rigidity. For the connecting girders a balk of timber reaching from king to



ELEVATION AND SECTION OF PLATFORM GANTRY SUPPORTING SCAFFOLD

queen legs is placed on each of the two topmost transoms, which may be from 4 to 8 ft. apart, the depth of the top bays often being modified to the required depth of the connecting beams. Upright struts are fixed at intervals of about 5 ft. between the two balks, which are also connected by long iron bolts and cross braces filled into each bay. The top balks project 6 or 10 ft. beyond the king leg and form the support for a working platform of deals. Struts are thrown out from the sides of the leg to support the ends of the balks. Upon the platform are laid two "sleepers" of balk timber extending from beneath the bed of the crane and passing over the centre of each queen leg. The "mast," a vertical member composed either of a single timber or two pieces struttied and braced, is erected upon the revolving crane bed, and the "jib," which is similar in construction to the mast, is attached to the base of the latter by a pivoted hinge. The jib is raised and lowered by a rope fixed near the end of the jib and running to the engine by way of a pulley wheel at the top of the mast. The rope or chain used for lifting the materials passes over a pulley at the end of the jib and thence to the winch over a pulley at the top of the mast. In the operation of lifting it is obvious that a great strain is put upon the mast and a considerable overturning force is exerted by the leverage of the weight lifted at the end of the jib. To counter-balance this, two timber "stays" or "guys" are taken from the mast head, one to the centre of each queen leg, and there secured. From these points two heavy chains are taken down the centre of each queen leg and anchored to the platform at their bases, which are each loaded with a quantity of bricks, stone or other heavy material equal in weight to at least twice any load to be lifted by the crane. A coupling screw link should be provided in the length of each anchor chain so that it may be kept taut. The coupling screws should be placed in an accessible place near the ground, where they may easily be seen and tightened when necessary. The legs of the structure should be cross braced with each other to resist

twisting tendencies due to wind pressure and swinging of the load, either by ties of steel bars with tightening screws, or, as is more usual, with diagonally placed scaffold-pole or squared-timber braces secured to the framework.

In the case of a three-towered gantry it is necessary to ballast only the two queen legs. Weighting of the king leg is unnecessary. With a square gantry having four legs, all should be weighted, and in calculating the ballast necessary for the crane towers the weight of the engine should be considered. Access to the platform is obtained by ladders fixed either inside or outside one of the queen legs. With the exception of the boards forming the working platform, which are usually spiked down, the timbers of a tower gantry should all be connected by screw bolts and nuts.

In steel framed buildings the derrick tower is unnecessary, the revolving jib, base and engine being supported by the steel work and raised to succeeding heights as the work proceeds.

Swinging scaffolds or cradles, used in connection with painting, renovating and light repair work consists of light rigidly framed platforms suspended from cantilever supports. They are capable of being raised or lowered by the occupants of the cradle by means of block and fall tackle. A newer type of cradle is a modified form of the suspended scaffolding already described, the raising and lowering being done by machines attached direct to the metal frames which hold the platform and guard rails, instead of by "block and fall."

Scaffolding for Chimneys.—Tall chimney shafts may be erected by internal scaffolding only, or by a combination of external and internal staging. The latter method is often adopted when the lower part of the shaft is designed with ornamental brick-work, string courses, panels, etc., and it is important that this work should be carefully finished. An external scaffold is therefore carried up until plain work not more than $2\frac{1}{2}$ or $3\frac{1}{2}$ bricks thick is reached, when the remainder can be completed by "overhand"